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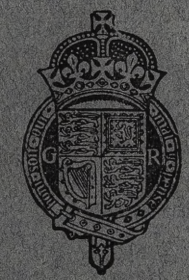
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THE  
REGISTRAR-GENERAL'S  
STATISTICAL REVIEW  
OF  
ENGLAND AND WALES  
FOR THE YEAR  
1931

(New Annual Series, No. 11)

TEXT

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THE

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**STATISTICAL REVIEW**

OF

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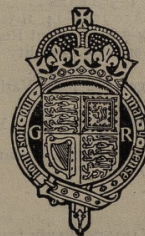
FOR THE YEAR

**1931**

(New Annual Series, No. II)

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## LIST OF CORRIGENDA IN THE STATISTICAL REVIEW.

### YEAR 1930.

#### TABLES: PART I.—MEDICAL.

Table 14 (Page 106). In heading of Col. 2 for 1929 read 1930.

#### TABLES: PART II.—CIVIL.

Table H (Page 64). The footnote to the table should read as follows :—

The table read *vertically* shows the number of *Wives* at each age, with the ages of their *Husbands* at marriage :— Thus : Of 15,111 *Wives* at the age of 19 and under 20 years, *four* married *Husbands* aged 16 and under 17 years, *thirty-one* married *Husbands* aged 17 and under 18 years, *two hundred and seventy-two* married *Husbands* aged 18 and under 19 years, *nine hundred and five* married *Husbands* aged 19 and under 20 years, &c. Read *horizontally* the table shows the number of *Husbands* at each age with the ages of their *Wives* at marriage :— Thus : Of 1,240 *Husbands* aged 18 and under 19 years, *fifty-one* married *Wives* aged 16 and under 17 years, *one hundred and ninety-six* married *Wives* aged 17 and under 18 years, &c.

### YEAR 1931.

#### TABLES: PART I.—MEDICAL.

Table 17 (Page 70). In footnote marked § for 462 read 489.

Table 25 (Page 331). In middle of page, International List No. 63-171 should be 163-171.

(Page 335). Cause 186 (1). Deaths of Females at All Ages. For 191 read 1919.

Appendix B (Page 394). All Causes F. Oct., 1930. For 17,108 read 17,170.

(Page 398). Causes 143-150. VIII. The Puerperal State. Oct., 1930. For 146 read 208.

Cause 146. Puerperal Sepsis. Oct., 1930. For 18 read 80.

#### TABLES: PART II.—CIVIL.

Table F (Page 59). Persons married per 1,000 population. City of London. For 8.1 read 80.7.

Ratio of local to National rate. City of London. For 519 read 5,173.

Table Q (Page 69). Birth-rate, 1930. Finland. For 25.4 read 20.6.  
Hungary. For 20.6 read 25.4.

Table W (Page 106). Marriages. Irish Free State. For 26,472 read 13,236.  
Deaths. Canada. For 194,449 read 104,449.



## STATISTICAL REVIEW, 1931.

*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 491,630 persons were registered in England and Wales during 1931, 249,717 of these being males and 241,913 females.

This number is 8 per cent. above that for 1930.

Deaths of civilians, including all deaths of females and 99·80 per cent. of those of males, are referred in tabulation to their administrative area of residence, and therefore figure in all tables relating to portions of the country. During the war and subsequent years, it was found, however, that similar treatment could not be satisfactorily applied to the deaths of non-civilians, which are therefore still excluded from some of the tables relating to local areas.

*Death-Rate.*—The 491,630 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 XV, from that of the standard population of 1901, this death-rate is reduced to 10·1.†

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

\* The term "standardized death-rate" means the death-rate corrected for differences of sex and age constitution of the population. For a description of the direct method employed for this "standardization" see the Annual Report for 1911 (pages xxvii-xxxii). 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. (*See Annual Report for 1913, page xx.*)

† This figure together with the death rates throughout this Review has been based, as explained in the section on Population (page 107), upon the corrected populations derived from the 1931 Census which have become available since the publication of Part I. This leads to small differences in certain rates from those given in Part I, and needs to be remembered when comparing rates at advanced ages with those for years just preceding 1931 which have not yet been corrected.



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 XV, 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 10.1 to 11.2 per thousand.

The rate of 10.1 per 1,000 is seen from Table 3 (Part I) to be the lowest recorded, except in the years 1928 and 1930, and is below the standardized rate of 10.3 for the preceding quinquennium, though the crude rate is slightly higher.

When compared with 1930, the year of lowest mortality, a further decrease in the rates occurred at the periods of school life, 5-15, the rates at 5-10 being the lowest ever recorded for both sexes. At all other ages for females, and at all other ages except 25-35 for males, there was an increase over the preceding year as shown in Table XV.

The causes of death which failed to show substantially lower rates in 1931 than in the preceding quinquennium, as may be gathered from Table 8, were cerebro-spinal fever and diseases of the heart in both sexes, cancer and diseases of the prostate in males, and diabetes and violent deaths in females. The causes chiefly responsible for the increase over 1930 were whooping cough, cerebro-spinal fever, influenza, diseases of the heart, respiratory diseases, arterio-sclerosis and cerebral hæmorrhage.

**Mortality at different portions of the year.**—Table 4 indicates that the first quarter was the chief contributor to the increase in the year's mortality over that for 1930. The first quarter was unusually cold in comparison with recent experience, the mean air temperature at Greenwich having been lower in only one out of the preceding ten years, and it was in the first quarter that 1931 mortality compared somewhat unfavourably with that of the preceding decennium.

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

It was pointed out in the Review for 1930 that the period since 1896-1900 has witnessed a progressive increase in the percentage contribution of the March quarter to the mortality of the year, whilst the contribution of the September quarter declined from 1896-1900 to 1916-20 and has since remained steady. These tendencies are continued in 1931.

When quinquennial periods are considered, the rates for the June and December quarters have maintained a remarkably

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

constant ratio to the yearly rate, though in individual years the ratios are low when the first quarter has a high mortality, and vice versa. For the 94 years 1838-1931 the mean rate for the December quarter is but 0.3 per 1,000 above that recorded in the June quarter (Table 4).

Table I. — Quarterly Death-rates in each quinquennium 1851-1930 and in 1931 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

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 13.2 in 1923, when the mean temperature at Greenwich in this quarter was the highest in 83 years' records, and 20.9 in 1929, an influenza year when the first quarter was exceptionally cold. Should these tendencies continue, the mortality experienced in the March quarter will virtually determine the death-rate for the year.

**Mortality of each sex.**—The excess of male over female mortality in 1931 was 26 per cent., as in 1930, this being the highest excess recorded. Comparing the sex rates age by age, male excess occurred at each age group except 10-15, this excess being greater at ages under 10, and smaller at ages 25-45 than in any of the preceding nine years. 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 II.—England and Wales.—Mortality of Males per cent. of that of Females at Various Ages from 1841-45 onwards. (See Table 5.)

	All Ages Standardized.	0-	5-	10-	15-	20-	25-	35-	45-	55-	65-	75-	85 and upwards.
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	123	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	116	119	98	96	100	108	108	118	123	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
1922 ..	122	123	104	94	104	116	113	130	129	132	126	119	108
1923 ..	123	124	105	100	104	113	118	131	132	132	127	120	113
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 ..	124	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 ..	123	122	113	100	108	110	111	139	143	134	126	117	103
1930 ..	126	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

\* Based on revised rates, see footnote † on page 1.

Table II shows that male excess is consistently low at ages 10-20, when during last century the rate for females was usually the higher, and rises to a maximum in middle life, after which it falls again with advancing age.

In 1931 the maximum disparity in sex mortality is recorded at ages 45-55, as was the case in 1926-30 and in each quinquennium from 1851 to 1910. Only in extreme old age has the female mortality not declined more than the male since the middle of last century, but in recent years a more rapid fall in male mortality has been taking place at ages 20-25.

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 2,247 per million, are seen to be, in order of importance, cancer of organs other than those of reproductive function (377), pneumonia (289), accident (288), heart disease (247), tuberculosis (205), and arterio-sclerosis (136). These six causes jointly contribute 69 per cent. of the total male excess.

### Infant Mortality.

Of the 491,630 deaths registered during the year, 41,939, or 8.5 per cent., were those of infants under one year of age.

The rate of infant mortality resulting from these deaths is 66 per 1,000 live births; this rate is 6 per 1,000 above that of the previous year but 2 per 1,000 less than the mean rate recorded in the preceding quinquennium.

The rates in the four quarters of the year were 94, 59, 46 and 67 respectively.

Table III affords a ready means of tracing the changes in the quarterly incidence of infantile mortality during the last 61 years. While the lowest death-rate at "all ages" has, with one exception, been recorded in the September quarter (Table I), it is remarkable that until 1901-05, and again, but to a very slight degree, in 1911-15, this quarter produced the highest infantile mortality. Thus, while the coldest months of the year yielded the highest general death-rate, the hot summer months levied the highest toll on infant life.

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

	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

Since the beginning of the present century, this experience has undergone a remarkable change. In all four quarters, the infant death-rate fell in each successive quinquennium, but with great inequality. Comparing 1931 with 1896-1900, the fall ranged from 34 per cent. in the March quarter, 52 in the June, and 55 in the December, to no less than 78 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, with its lower rate of decrease, yields the highest.

The changes in the infant mortality rate from all causes and from diarrhoeal diseases since 1861-65 are shown in Table IV.

Table IV.—England and Wales: Infant Mortality, distinguishing Mortality from Diarrhoeal Diseases, 1861-1931.

Deaths under 1 year of age per 1,000 Live Births.

Year.	Diarrhoeal Diseases.	Other Causes.	All Causes.	Year.	Diarrhoeal Diseases.	Other Causes.	All Causes.
1861-65	15	136	151	1921	14	69	83
1866-70	20	137	157	1922	6	71	77
1871-75	19	134	153	1923	7	62	69
1876-80	16	129	145	1924	6	69	75
1881-85	14	125	139	1925	7	68	75
1886-90	17	128	145				
1891-95	20	131	151	1926	8	62	70
1896-00	31	125	156	1927	6	64	70
1901-05	23	115	138	1928	6	59	65
1906-10	18	99	117	1929	7	67	74
1911-15	19	91	110	1930	5	55	60
1916-20	9	81	90				
1921-25	8	68	76	1931	5	61	66
1926-30	6	62	68				

The mean rates in successive triennial periods from 1911-13 to 1929-31 were 111, 100, 94, 80, 73, 68, 67, and from this sequence it seems probable that any further fall in future years will be at a decreasing rate.

When compared with 1930 the increase in 1931 is seen from Table V to apply to all stages of infancy, except the first day of life, at which period the rate has remained stationary for four years.

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 3 to 12 months mortality rates in 1931 were lower than in the preceding quinquennium. During the first week of life the slight increase noted for the last quinquennium was continued in 1931, reducing the total decline since 1906-10 to 9.8 per cent., but it is probable that the high proportion of deaths at this age of non-viable infants with but little prospect

of surviving birth renders the mortality less susceptible to the influences and efforts which have effected the substantial reductions at later periods of the first year.

Table V.—England and Wales: Age Distribution of Infant Mortality, 1881-1931.

Rates per 1,000 (Live) Births.

Year.	Days.		Weeks.				Months.					Total under one year.
	0-1	1-7	0-1	1-2	2-3	3-4	Total under four weeks	Four weeks to 3 m'nths	3-6	6-9	9-12	
1881-1885	—	—	—	—	—	—	67	28	44	—	—	139
1886-1890	—	—	—	—	—	—	69	30	46	—	—	145
1891-1895	—	—	—	—	—	—	74	31	46	—	—	151
1896-1900	—	—	—	—	—	—	74	34	48	—	—	156
1901-1905	—	—	—	—	—	—	70	28	40	—	—	138
1906-1910	11.5	13.0	24.5	5.8	5.7	4.2	40.2	22.8	17.3	14.8	—	117.1
1911-1915	11.4	12.7	24.1	5.7	5.3	3.9	39.0	20.2	19.6	15.9	14.1	108.7
1916-1920	11.0	12.4	23.4	5.6	4.7	3.4	37.0	16.5	14.6	12.0	10.8	90.9
1921-1925	10.4	11.3	21.7	5.0	3.9	2.8	33.4	12.8	11.3	9.2	8.3	74.9
1926-1930	10.3	11.5	21.8	4.3	3.2	2.4	31.8	10.9	9.6	8.1	7.5	67.9
1906	11.8	13.2	25.0	6.1	6.2	4.6	41.9	25.7	27.0	20.7	17.2	132.5
1907	11.3	13.1	24.4	6.0	5.9	4.5	40.7	23.3	21.3	17.3	15.1	117.6
1908	11.5	12.8	24.3	5.9	5.8	4.3	40.3	24.2	23.6	17.7	14.6	120.4
1909	11.6	13.2	24.7	5.7	5.3	4.0	39.8	20.4	19.2	15.6	13.8	108.7
1910	11.5	12.5	24.1	5.4	5.1	3.8	38.5	20.0	18.8	15.0	13.2	105.4
1911	11.6	12.7	24.3	6.0	6.0	4.5	40.6	24.7	25.9	20.6	17.4	129.2
1912	11.3	12.9	24.2	5.6	5.0	3.7	38.4	17.7	14.9	12.5	11.4	94.7
1913	11.8	12.7	24.5	5.8	5.4	3.9	39.5	20.3	19.8	15.7	13.6	108.9
1914	11.4	12.7	24.1	5.5	5.0	3.9	38.5	19.3	18.7	15.0	13.0	104.4
1915	10.9	12.5	23.4	5.7	5.0	3.7	37.7	18.6	18.2	16.0	15.2	105.8
1916	10.9	12.3	23.2	5.6	4.9	3.4	36.9	16.9	15.2	11.7	10.3	91.1
1917	11.0	12.4	23.4	5.6	4.8	3.4	37.1	16.9	15.0	11.6	10.6	91.1
1918	11.1	12.1	23.2	5.5	4.6	3.4	36.6	17.1	16.1	14.4	13.7	97.9
1919	12.2	13.7	25.9	6.1	4.9	3.6	40.4	16.4	14.4	11.8	10.3	93.2
1920	10.4	11.5	21.9	5.3	4.6	3.3	35.0	15.5	13.0	11.0	10.0	84.5
1921	10.8	11.6	22.4	5.4	4.5	3.0	35.2	14.7	13.7	9.7	7.8	81.2
1922	10.4	11.6	22.0	5.2	4.1	2.8	33.9	12.4	10.6	9.2	8.6	74.7
1923	10.2	10.9	21.1	4.6	3.6	2.6	31.9	11.4	10.0	8.3	7.6	69.2
1924	10.6	11.2	21.8	4.8	3.8	2.6	33.0	12.4	10.8	9.3	8.8	74.2
1925	10.1	11.1	21.2	4.7	3.7	2.7	32.3	12.5	11.2	9.4	9.0	74.5
1926	10.0	11.3	21.3	4.6	3.6	2.5	31.9	11.6	10.4	8.6	7.7	70.2
1927	10.6	11.6	22.2	4.3	3.4	2.5	32.3	10.7	9.7	8.7	8.2	69.7
1928	10.4	11.2	21.6	4.1	3.0	2.4	31.1	10.7	9.2	7.4	6.8	65.1
1929	10.4	11.9	22.3	4.6	3.3	2.6	32.8	11.6	10.7	9.9	9.4	74.4
1930	10.4	11.6	22.0	3.8	2.9	2.2	30.9	9.6	7.8	6.1	5.5	60.0
1931	10.4	11.7	22.1	4.0	3.1	2.4	31.6	10.9	9.3	7.8	6.8	66.4

Rates per 1,000 of those for 1906-10.

	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1906-1910	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1911-1915	991	977	984	983	930	929	970	886	891	919	953
1916-1920	957	954	955	966	825	810	920	724	664	694	730
1921-1925	904	869	886	862	684	667	831	561	514	532	561
1926-1930	896	885	890	741	561	571	791	478	436	468	507
1926	870	869	869	793	632	595	794	509	473	497	520
1927	922	892	906	741	596	595	803	469	441	503	554
1928	904	862	882	707	526	571	774	469	418	428	459
1929	904	915	910	793	579	619	816	509	486	572	635
1930	904	892	898	655	509	524	769	421	355	353	372
1931	904	900	902	690	544	571	786	478	423	451	459

Distribution of Infant Mortality.—Table VI shows how infant mortality was distributed in 1931 between the sexes and throughout the country.



In this and later tables a new regional sub-division of England and Wales has been employed for the first time, and makes possible a concise analysis of mortality in greater detail than hitherto, including the separation of Greater London as an unit area.\*

The rates for the aggregates of different classes of area are, as usual, highest for the county boroughs and lowest for rural districts, London occupying an intermediate position together with the smaller towns. In London's outer ring, which comprises almost as great a population as London itself, infant mortality was lower than in the aggregate of all the rural districts outside Greater London, and was 13 per 1,000 births less than in the Administrative County. The only region showing a lower rate than this was the remainder of South-East England.

It has been noticed almost invariably since 1911 that the Northern county boroughs have had the highest and rural districts in the South the lowest rate, the respective values in 1930 being 75 and 44. In 1931 the rate in the North region as a whole was 79.6 and in Wales 74.2, the corresponding rates in 1930 being 70 and 67. The new grouping adopted in Table VI, although not differentiating urban from rural districts within each region, aims at separating predominantly industrial from agricultural counties within the large regions, and in so doing it makes apparent a greater range of infant mortality than did the former classification.

North I, comprising Northumberland and Durham, shows the highest rate of 88.8 per 1,000 births, this rate being 134 per cent. of the rate in England and Wales. North IV, Lancashire and Cheshire, follows with 120 per cent., Wales I with 115, North II with 114 and North III with 111. Wales II and the Midland regions showed rates approximating to those for the country as a whole. The Midlands as hitherto defined, which recorded 91 per cent. of the rate for the whole country in 1930, included five counties north of the Thames which are now included

\*Regional Summary.—The country has been re-divided into regions, after consultation with other Government Departments with a view to securing greater homogeneity in the character of the sectional populations than was provided by the old grouping into North, Midlands, South (including London) and Wales. The counties in the various regions are as follows:—

<i>South East.</i> Bedfordshire. Berkshire. Buckinghamshire. Essex. Hertfordshire. Kent. London. Middlesex. Oxfordshire. Southampton. Surrey. Sussex East. West. Wight, Isle of.	<i>North I.</i> Durham. Northumberland.  <i>North II.</i> Cumberland. Westmorland. Yorkshire— East Riding. North Riding.  <i>North III.</i> Yorkshire, West Riding. York C.B.  <i>North IV.</i> Cheshire. Lancashire.	<i>Midland I.</i> Gloucestershire. Herefordshire. Shropshire. Staffordshire. Warwickshire. Worcestershire.  <i>Midland II.</i> Derbyshire. Leicestershire. Northamptonshire. Nottinghamshire. Peterborough, Soke of.	<i>East.</i> Cambridgeshire. Ely, Isle of. Huntingdonshire. Lincolnshire— Parts of Holland. " Kesteven. " Lindsey. Norfolk. Rutlandshire. Suffolk, East. " West.  <i>South West.</i> Cornwall. Devonshire. Dorsetshire. Somersetshire. Wiltshire.	<i>Wales I.</i> Brecknockshire. Carmarthenshire. Glamorganshire. Monmouthshire.  <i>Wales II.</i> Anglesey. Caernarvonshire. Cardiganshire. Denbighshire. Flintshire. Merionethshire. Montgomeryshire. Pembrokeshire. Radnorshire.
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For the constitution of Greater London, see pp. 63-65 of the Preliminary Report on the Census of England and Wales, 1931.

in the South-east region and are characterised by the low mortality of that region, so the new Midland region occupies a more clearly defined intermediate position between North and South than formerly.

Greater London showed an infant mortality 89 per cent. of that in England and Wales, and this was followed by the Eastern Counties with 84, the South-west with 80, and the South-eastern region (excluding Greater London) with 69 per cent., this latter division showing a rate of only 45.5 per 1,000 births.

Table VI.—Distribution of Infant Mortality, 1931.

	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.	Females	Both Sexes.	Both Sexes.		Males.	Females	Both Sexes.	Both Sexes.
England and Wales ..	75.2	57.1	66.4	100					
South-east .. .. .	61.0	46.3	53.8	81	East .. .. .	66.7	44.8	55.9	84
Greater London .. .	66.7	50.9	59.0	89	South-west .. .	59.9	45.5	52.9	80
Remainder of South-east	51.7	38.9	45.5	69	Wales .. .. .	83.8	64.1	74.2	112
North .. .. .	90.4	68.4	79.6	120	Wales I .. .. .	86.1	66.1	76.4	115
North I .. .. .	98.8	78.3	88.8	134	Wales II .. .. .	76.6	57.9	67.4	102
North II .. .. .	84.7	65.5	75.4	114	County Boroughs* .. .	87.3	66.3	77.0	116
North III .. .. .	83.3	63.9	73.8	111	Other Urban Districts*	73.5	55.6	64.8	98
North IV .. .. .	91.9	67.2	79.8	120	Rural Districts* .. .	65.6	49.6	57.8	87
Midland .. .. .	74.7	58.1	66.6	100	Greater Admin. County	72.3	57.3	65.0	98
Midland I .. .. .	74.2	58.3	66.5	100	London { Outer Ring	60.5	43.8	52.3	79
Midland II .. .. .	75.5	57.9	66.9	101					

\* Excluding Greater London

The extent of the fall in infant mortality during the past twenty years, revealed in Tables V, VII and VIII, has been fairly uniform in different classes of area and parts of the country, the fall in 1931 below the 1916-20 standard being 26 per cent. in the country as a whole, 28 per cent. in London Administrative County, 24 per cent. in the North, 27 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 VII that the fall since 1911-15 has been 40 per cent. in London, 39 per cent. in the county boroughs, 42 per cent. in the small towns and 36 per cent. in the rural districts.

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

In this table the comparison has been continued for 1931 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.

Although, for the first 4 weeks of life, London maintained in 1931 the advantage over other classes of area which has been



evident since 1911, the mortality increase over 1930 at this age and at 4 weeks to 3 months was greater in London than elsewhere. At 6-12 months, on the other hand, the county boroughs showed much the greatest increase, the London rate at 9-12 months being in fact lower than in 1930. Since 1911-15 the relative improvement to 1931 has been greatest in the small towns at 3-9 months, next in order coming London and the small towns at 9-12 months, and the rural districts at 3-12 months.

The new density summary employed in other tables, which will be used in future years for this analysis, differs from the old in that the areas comprising London's outer ring are excluded from the aggregates. Since the outer ring as a whole is characterised by exceptionally low mortality rates (Tables VI and IX), its exclusion must have some tendency to raise the rates resulting, and in order to ascertain to what extent this change may invalidate comparisons of the new aggregates in future years with the old aggregates in past years, the 1931 rates per 1,000 births on each basis are contrasted below.

		Total under 1 year.	Under 4 weeks.	4 weeks to 3 months.	3-6 months.	6-9 months.	9-12 months.
County boroughs	New	77.02	33.67	12.75	11.70	9.92	8.99
	Old	76.20	33.20	12.70	11.71	9.78	8.82
Other urban districts	New	64.84	32.97	10.41	8.04	6.98	6.45
	Old	61.93	31.57	10.05	7.82	6.47	6.02
Rural districts	New	57.81	32.13	8.75	6.35	5.74	4.84
	Old	57.55	32.01	8.70	6.33	5.69	4.81

For the rural districts the rates differ by less than 1 per cent., and the change is of no importance. For the county boroughs, the rates on the new basis are in excess by about 1 per cent. for the first year as a whole, and for 0-3 months and 6-9 months, and by about 2 per cent. at 9-12 months, so comparison will not be seriously affected.

For the small towns, however, the rates for the new aggregate are in excess of those for the old by about 5 per cent. for the first year as a whole and for the first 4 weeks of life, 3 per cent. at 4 weeks to 6 months, 8 per cent. at 6-9 months and 7 per cent. at 9-12 months; and this must be borne in mind in any future comparison between infant mortality rates for the new aggregate of "other urban districts" and the rates for previous years.

Table VIII 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 15 per cent., but in Wales the improvement up to 1921-25 has not been maintained in more recent years. At all later stages of infancy, improvement in the North has not kept pace with that in the rest of England, the

Table VII.—Infant Mortality in Relation to Urbanization. Mortality (per 1,000 Live Births) at various Stages of Infancy in different Classes of Area per 1,000 of that for 1911-15.

	Under 4 Weeks.				4 Weeks to 3 Months.				3-6 Months.				
	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	
1926 ..	743	821	825	824	519	589	546	622	548	556	485	521	
1927 ..	714	828	848	844	448	531	512	623	476	516	466	503	
1928 ..	718	798	801	813	544	537	497	543	598	500	387	449	
1929 ..	756	829	844	893	553	572	544	632	581	580	483	534	
1930 ..	706	783	795	837	460	507	437	487	491	425	329	387	
1931 ..	743	797	811	850	557	547	511	544	574	510	410	437	
		6-9 Months.				9-12 Months.				Total under 1 Year.			
		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	
1926 ..	501	562	502	541	513	571	497	536	591	654	624	671	
1927 ..	504	547	509	580	456	603	549	637	547	640	630	692	
1928 ..	583	458	415	434	577	488	406	468	620	599	564	619	
1929 ..	676	647	548	600	652	700	592	629	656	689	649	721	
1930 ..	474	370	345	371	450	387	350	406	544	547	523	594	
1931 ..	540	508	414	490	431	512	437	486	598	613	578	642	

Table VIII.—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	1,540	
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 ..	859	871	855	952	660	687	650	699	665	673	657	695	
1931 ..	853	854	854	971	660	696	632	709	647	672	621	642	
		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	1,273	
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	

\* Excluding London Administrative County (see Table VII).



contrast being greatest at 9-12 months, when the extent of fall has been only 29 compared with 39 per cent., whilst in Wales, except at 3-6 months, the rate of fall has been not quite so great as in the North.

The analysis of infant mortality by detail of age, initiated in 1905 with distinction of registration counties mainly urban and mainly rural in character, and expanded in 1917, is further extended in Table 13, in terms of the new regional classification. 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.

In Tables IX and X the regional distribution of mortality at different periods of the first year of life is shown in greater detail than in previous years. The chance of dying within half an hour of birth ranged from 2 per 1,000 in the Midland region to 1.8 in the North, 1.6 in Greater London and the East, 1.2 in the South-West, and 1.1 in the South-East (excluding Greater London) and in Wales. 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, and 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 region, the sequence being then as usual from North to South. For the combined mortality from the second to the seventh day, this sequence is repeated, Wales showing 121 per cent. and Greater London only 76 per cent. of the rate for England and Wales. The South-East, excluding Greater London, shows from this period onwards considerably lower rates than the South-West. From the second week onwards, North I gives the highest rates, relative mortality progressively increasing to 169 per cent. of that in England and Wales at 9-12 months, whilst the relative mortality declines to 78 per cent. at this age in Wales II, to 63 per cent. in the South-West, to 59 per cent. in the East, and to 49 per cent. in the South-East, excluding Greater London. The range of the relative regional mortality rates thus increases from 82-114 for the first day to 49-169 at 9-12 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 1931 by contrasting London Administrative County with its outer ring of suburbs. These rates were equal for the first day, and at 1-7 days and under 4 weeks the rate was actually higher in the outer ring, but by 6-9 months the rate for the outer ring was only 54 per cent. of that for London itself, and at 9-12 months 69 per cent. Outside Greater London the rates during the first week are unaffected by urbanization, but from the second week onwards the divergence between the county boroughs and rural districts rapidly increases to 58 per cent. of the rate for England and Wales at 3-6 months, and to 61 per cent. at 9-12 months.







Table X.—Infant Mortality at various Ages, in different parts of the Country, per cent. of that of all Infants of the same Age in England and Wales, 1931.

	Total under one year.	Under 30 minutes.	30 minutes and under 1 day.	Total under 1 day.	Days.						1 day and under 1 week.	Weeks.				Months.					
					1	2	3	4	5	6		0	1	2	3	Total under 4 weeks.	4 weeks to 3 months.	3-6	6-9	9-12	
England and Wales ..	{ P. 100 M. 113 F. 86	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
South-East .. .. .		81	88	87	88	83	81	73	75	67	75	79	82	80	81	75	81	83	89	77	71
Greater London .. .. .		89	100	90	90	83	77	64	67	78	75	76	83	78	74	79	81	95	109	92	84
Remainder of South-East ..		69	69	85	82	86	87	82	92	67	75	83	82	80	87	63	81	64	57	54	49
North .. .. .		120	113	109	110	111	113	118	117	122	113	115	112	115	116	117	113	120	125	129	135
North I .. .. .		134	119	110	111	117	126	109	108	111	88	115	113	128	145	138	120	129	149	147	169
"  II .. .. .		114	119	113	113	109	116	105	117	122	100	112	112	105	106	104	110	118	100	117	138
"  III .. .. .		111	119	113	113	109	106	127	108	144	113	114	114	120	119	96	114	108	110	112	106
"  IV .. .. .		120	106	107	106	111	113	118	117	133	113	115	111	108	106	121	110	123	127	133	137
Midland .. .. .		100	125	105	106	97	106	114	117	100	100	105	105	98	103	104	105	93	95	99	101
Midland I .. .. .		100	125	103	106	100	106	105	100	100	100	103	104	100	94	104	103	94	95	99	106
"  II .. .. .		101	119	106	107	97	103	132	142	111	113	110	109	98	123	113	109	90	95	99	91
East .. .. .		84	100	92	92	103	110	91	83	78	88	97	95	113	84	104	97	87	69	71	59
South-West .. .. .		80	75	90	88	109	74	100	133	89	125	100	94	98	90	92	94	80	60	59	63
Wales .. .. .		112	69	118	111	120	116	136	125	111	113	121	116	115	119	125	117	113	98	101	116
Wales I .. .. .		115	75	116	109	120	126	132	125	122	113	123	116	115	126	129	118	116	99	109	128
"  II .. .. .		102	56	128	114	117	87	159	133	100	113	117	116	115	100	104	113	105	96	78	78
County Boroughs* .. .. .		116	106	106	105	103	106	105	108	111	113	106	105	108	106	117	107	117	126	127	132
Other Urban Districts* .. .. .		98	94	101	99	106	110	114	108	111	88	108	104	105	113	96	104	95	86	90	94
Rural Districts* .. .. .		87	100	103	102	103	103	109	117	100	88	105	104	98	100	92	102	81	68	73	71
Greater London { Admin. County ..		98	100	90	90	89	74	59	58	67	75	74	81	78	74	83	80	106	131	118	99
{ Outer Ring ..		79	100	90	90	77	84	68	83	78	63	78	84	80	74	75	82	83	84	64	68

\* Excluding Greater London.



The increasing divergence of mortality rates both by regions and population density as the first year of life advances probably results from increasing sensitiveness to external environment as the infant becomes less protected by maternal care.

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 1931 in Table XI.

Table XI.—England and Wales, 1931 :  
Mortality of the first 30 Minutes of Life.

International List Numbers.	Cause of Death.	All Infants.	Under 30 minutes.						
			Legitimate.			Illegitimate.			
			Males.	Fe-males.	Both Sexes.	Males.	Fe-males.	Both Sexes.	
			Deaths.						
86	Convulsions .. .. .	—	—	—	—	—	—	—	—
157	Congenital malformations .. .. .	70	25	42	67	1	2	3	3
158	Congenital debility .. .. .	51	29	19	48	2	1	3	3
159	Premature birth .. .. .	394	207	160	367	13	14	27	27
160	Injury at birth .. .. .	172	97	56	153	16	3	19	19
161 (a)	Atelectasis .. .. .	105	53	47	100	2	4	6	6
161 (b & c)	Other diseases peculiar to early infancy .. .. .	5	4	1	5	—	—	—	—
194 : 1	Lack of care .. .. .	158	13	28	41	56	61	117	117
182	Accidental suffocation .. .. .	—	—	—	—	—	—	—	—
172-175	Homicide .. .. .	16	—	—	—	7	9	16	16
	Other forms of violence .. .. .	45	1	1	2	17	26	43	43
	<i>Violence and lack of care</i> .. .. .	219	14	29	43	80	96	176	176
	Other causes .. .. .	17	3	2	5	10	2	12	12
	All causes .. .. .	1,034	432	356	788	124	122	246	246
			Mortality per Million (live) Births.						
86	Convulsions .. .. .	—	—	—	—	—	—	—	—
157	Congenital malformations .. .. .	111	81	142	111	69	147	107	107
158	Congenital debility .. .. .	81	94	64	79	138	73	107	107
159	Premature birth .. .. .	623	670	543	608	900	1,026	961	961
160	Injury at birth .. .. .	272	314	190	253	1,108	220	676	676
161 (a)	Atelectasis .. .. .	168	171	159	166	138	293	214	214
161 (b & c)	Other diseases peculiar to early infancy .. .. .	8	13	3	8	—	—	—	—
194 : 1	Lack of care .. .. .	250	42	95	68	3,877	4,471	4,166	4,166
182	Accidental suffocation .. .. .	—	—	—	—	—	—	—	—
172-175	Homicide .. .. .	25	—	—	—	485	660	570	570
	Other forms of violence .. .. .	71	3	3	3	1,177	1,906	1,531	1,531
	<i>Violence and lack of care</i> .. .. .	346	45	98	71	5,539	7,037	6,266	6,266
	Other causes .. .. .	27	10	7	8	692	147	427	427
	All causes .. .. .	1,636	1,398	1,207	1,305	8,585	8,942	8,759	8,759
			Percentage of Total under 24 hours.						
86	Convulsions .. .. .	—	—	—	—	—	—	—	—
157	Congenital malformations .. .. .	16	12	20	16	13	20	17	17
158	Congenital debility .. .. .	16	17	14	16	20	14	18	18
159	Premature birth .. .. .	9	9	10	9	7	10	8	8
160	Injury at birth .. .. .	29	29	25	28	57	25	48	48
161 (a)	Atelectasis .. .. .	20	19	22	20	12	27	19	19
161 (b & c)	Other diseases peculiar to early infancy .. .. .	13	20	5	13	—	—	—	—
194 : 1	Lack of care .. .. .	90	87	90	89	89	92	91	91
182	Accidental suffocation .. .. .	—	—	—	—	—	—	—	—
172-175	Homicide .. .. .	76	—	—	—	78	75	76	76
	Other forms of violence .. .. .	79	33	100	50	85	79	81	81
	<i>Violence and lack of care</i> .. .. .	30	52	67	61	87	85	86	86
	Other causes .. .. .	27	12	12	12	83	25	60	60
	All causes .. .. .	16	13	14	13	34	41	37	37



The table shows that this very early mortality displays in 1931 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 6,266 per million for illegitimate infants compares with one of 71 for the legitimate; 80 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.

Table XII.—England and Wales: Comparison of Infant Mortality Rates (per 1,000 Live Births) in 1931 with those of recently preceding years.

	Under 4 weeks.	4 weeks to 3 months.	3-6 months.	6-9 months.	9-12 months.	Under 1 year.
Increase or Decrease of Mortality in 1931, per cent. of that in 1930.						
	+ 2	+ 13	+ 19	+ 28	+ 23	+ 11
Increase or Decrease of Mortality in 1931, per cent. of that in 1926-30.						
	- 1	—	- 3	- 5	- 9	- 2
Increase or Decrease from various Causes, as compared with 1926-30.						
Measles (7) .. .. .	—	- 0.01	+ 0.02	- 0.04	- 0.07	- 0.09
Whooping cough (9) .. .. .	- 0.02	- 0.13	- 0.14	- 0.22	- 0.25	- 0.77
Influenza (11) .. .. .	+ 0.01	+ 0.06	+ 0.05	+ 0.03	- 0.02	+ 0.13
Tuberculosis, all forms (23-32) .. .. .	—	- 0.02	- 0.03	+ 0.04	- 0.01	- 0.02
Convulsions (86) .. .. .	- 0.31	- 0.13	- 0.06	- 0.02	- 0.04	- 0.56
Bronchitis and pneumonia (106-109) .. .. .	+ 0.18	+ 0.49	+ 0.40	+ 0.03	- 0.18	+ 0.93
Diarrhoea and enteritis (119) .. .. .	- 0.12	- 0.22	- 0.51	- 0.28	- 0.15	- 1.27
Developmental and wasting diseases (157-159, 161 a, b) .. .. .	+ 0.19	+ 0.02	- 0.03	- 0.04	- 0.01	+ 0.13
<i>Congenital defects (malformations and atelectasis) (157, 161a).</i> .. .. .	+ 0.30	+ 0.22	+ 0.13	+ 0.02	+ 0.01	+ 0.67
<i>Congenital debility and icterus (158, 161b).</i> .. .. .	- 0.50	- 0.24	- 0.09	- 0.04	- 0.01	- 0.87
<i>Premature birth (159)</i> .. .. .	+ 0.37	+ 0.04	- 0.07	- 0.01	—	+ 0.34
Injury at birth (160) .. .. .	+ 0.20	+ 0.02	—	—	—	+ 0.22
Suffocation—in bed or not stated how (182 part) .. .. .	- 0.07	- 0.02	—	—	—	- 0.11
Other causes .. .. .	- 0.25	- 0.06	+ 0.04	+ 0.11	+ 0.04	- 0.13
All causes .. .. .	- 0.21	—	- 0.25	- 0.38	- 0.69	- 1.53
Percentage Increase or Decrease as compared with 1926-30.						
Measles (7) .. .. .	—	- 25	+ 22	- 11	- 10	- 7
Whooping cough (9) .. .. .	- 33	- 27	- 25	- 32	- 34	- 90
Influenza (11) .. .. .	+ 17	+ 55	+ 33	+ 17	- 11	+ 19
Tuberculosis, all forms (23-32) .. .. .	—	- 22	- 11	+ 12	- 3	- 2
Convulsions (86) .. .. .	- 22	- 24	- 16	- 8	- 22	- 20
Bronchitis and pneumonia (106-109) .. .. .	+ 14	+ 17	+ 12	+ 1	- 5	+ 7
Diarrhoea and enteritis (119) .. .. .	- 18	- 13	- 24	- 22	- 20	- 20
Developmental and wasting diseases (157-159, 161 a, b) .. .. .	+ 1	+ 1	- 3	- 11	- 5	—
<i>Congenital defects (malformations and atelectasis) (157, 161a).</i> .. .. .	+ 6	+ 20	+ 29	+ 11	+ 9	+ 10
<i>Congenital debility and icterus (158, 161b).</i> .. .. .	- 17	- 22	- 16	- 25	- 12	- 18
<i>Premature birth (159)</i> .. .. .	+ 2	+ 3	- 41	- 33	—	+ 2
Injury at birth (160) .. .. .	+ 11	+ 67	—	—	—	+ 12
Suffocation—in bed or not stated how (182 part) .. .. .	- 27	- 12	—	—	—	- 19
Other causes .. .. .	- 11	- 5	+ 3	+ 9	+ 4	- 2
All causes .. .. .	- 1	—	- 3	- 5	- 9	- 2

Note.—The percentages in this table are based on rates per 100,000 live births, and differ on this account from those derivable from Table V.

Of the 176 deaths of illegitimate infants assigned to these headings 121 or 69 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 1931 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 XII between the mortality from the chief causes distinguished at various ages in 1931 and 1926-30, and from all causes in 1931 and 1930.

The increase of 11 per cent. between 1930 and 1931 is seen to have been shared by all stages of infancy, but to have applied particularly to its later months, which are those most affected by environmental influences, as already stated.

Of the separate headings in the table, six show increases as compared with the average rates for the preceding five years. The slight increase for influenza (0.13) was accompanied by an increase for bronchitis and pneumonia (0.93), whilst the increases due to congenital malformations (0.67) and injury at birth (0.22) continue the tendency to rise which the mortality from these causes has exhibited since 1923, their rate in 1931 being the highest recorded in Table 12. Mortality from premature birth has since 1922 risen and fallen each year with the influenza rate.

The most important decreases were for diarrhoea and enteritis (1.27), congenital debility (0.87) and whooping cough (0.77), the mortality from the first two causes being the lowest recorded in the last 11 years.

Table XIII, which contrasts the mortality of male with that of female, and of legitimate with that of illegitimate infants, shows that the excess in mortality of males, which had increased with the fall of infant mortality during the present century to 32 per cent. in 1928, has continued to exhibit an inverse relation to the changes in infant mortality since that year, falling to 32 per cent. in 1931 from the maximum of 33 in the preceding year. It was, as usual, greatest in the second and third months of life, and greater for the legitimate than the illegitimate.

This male excess continues to be shared by all the causes distinguished in Table XIII except whooping cough, its extent ranging from 18 per cent. for measles to 55 for congenital debility, and convulsions.

Excess for the illegitimate is, as usual, very much greater for syphilis than for any other cause distinguished in the table.



Table XIII.—England and Wales : Infant Mortality by Sex and Legitimacy, 1931.

	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.	
<b>All causes.</b>												
Under four weeks .. ..	35.77	27.20	34.68	26.14	59.20	50.14	132	133	118	171	192	
4 weeks-3 months .. ..	12.60	9.02	12.14	8.65	22.50	17.08	140	140	132	185	197	
3-6 months .. ..	10.76	7.83	10.41	7.50	18.14	15.10	137	139	120	174	201	
6-9 " .. ..	8.62	6.84	8.46	6.73	12.05	9.24	126	126	130	142	137	
9-12 " .. ..	7.45	6.17	7.38	6.07	9.00	8.43	121	122	107	122	139	
Total under 1 year .. ..	75.20	57.07	73.07	55.08	120.89	99.98	132	133	121	165	182	
<b>All ages under one year.</b>												
Measles (7) .. ..	1.23	1.04	1.24	1.03	1.04	1.32	118	120	79	84	128	
Whooping cough (9) .. ..	1.66	1.92	1.63	1.91	2.15	2.13	86	85	101	132	112	
Tuberculosis, all forms (23-32) .. ..	1.17	0.93	1.16	0.93	1.38	0.95	126	125	145	119	102	
Syphilis (34) .. ..	0.57	0.44	0.47	0.37	2.84	2.05	130	127	139	604	554	
Convulsions (86) .. ..	2.70	1.74	2.66	1.72	3.60	2.35	155	155	153	135	137	
Bronchitis and pneumonia (106-109) .. ..	17.21	13.09	17.04	12.88	20.91	17.81	131	132	117	123	138	
Diarrhoea and enteritis (119) .. ..	6.15	4.20	5.84	3.94	12.67	9.82	146	148	129	217	249	
Developmental and wasting diseases (157-159, 161 a and b) .. ..	33.10	25.39	32.22	24.58	51.79	42.95	130	131	121	161	175	
Congenital defects (malformations and atelectasis) (157, 161a) .. ..	8.05	6.26	8.06	6.17	7.82	8.21	129	131	95	97	133	
Congenital debility, sclerema and icterus (158, 161b) .. ..	4.67	3.02	4.48	2.85	8.65	6.60	155	157	131	193	232	
Premature birth (159) .. ..	20.38	16.11	19.68	15.56	35.31	28.15	127	126	125	179	181	
Other causes .. ..	11.41	8.32	10.81	7.72	24.51	20.60	137	140	119	227	267	
All causes .. ..	75.20	57.07	73.07	55.08	120.89	99.98	132	133	121	165	182	

Distribution throughout the country of Infant Mortality from various causes.—Table XIV, 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.

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 suffocation and injury at birth, producing a net excess of 22.43 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, yielding a total rate 20.88 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. This has been revealed by the regional classification hitherto used in each of the nine preceding years, so the predominant influence of these causes in determining local variations of infant mortality is evident. Jointly they account in 1931 for 61 per cent of the divergence above the mean in North I, and for 67 per cent. of the divergence below the mean in the South-East, excluding Greater London. The most potent influence is that of bronchitis and pneumonia, which is always of chief importance.

Table XIV.—Comparison of Infant Mortality from the Principal Causes in Geographical Regions, 1931.

	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 .. ..	- 87	- 21	- 18	- 8	-129	- 373	- 20	- 70	- 83	-354	- 15	- 1	- 73	- 1,252
Greater London .. ..	- 87	+ 7	- 26	- 2	-125	- 160	+145	- 66	-107	-326	- 9	- 2	+ 24	- 734
Remainder of South-East .. ..	- 88	- 66	- 5	- 19	-136	- 719	-287	- 76	- 45	-400	- 23	+ 1	-225	- 2,088
North .. ..	+ 81	+ 38	+ 25	+ 9	+ 99	+ 519	+104	+ 32	+ 61	+234	+ 5	- 9	+130	+ 1,328
North I .. ..	+233	+ 25	+ 89	+ 21	+243	+1008	+109	+ 32	+127	+254	- 6	- 19	+127	+ 2,243
North II .. ..	+109	- 22	+ 51	+ 3	+103	+ 484	- 51	+ 23	+ 31	+215	- 32	- 7	+ 3	+ 910
North III .. ..	- 11	- 6	+ 17	+ 13	+ 60	+ 318	- 50	+ 43	- 22	+217	- 11	+ 15	+159	+ 742
North IV .. ..	+ 57	+ 81	- 4	+ 2	+ 55	+ 421	+223	+ 29	+ 85	+239	+ 27	- 19	+147	+ 1,343
Midland .. ..	+ 23	- 9	- 9	- 3	- 48	- 56	+ 15	+ 14	+ 4	+159	+ 18	+ 17	- 98	+ 27
Midland I .. ..	+ 38	- 51	- 16	+ 1	- 96	- 19	+ 42	+ 17	- 27	+175	+ 25	+ 16	- 93	+ 12
Midland II .. ..	- 8	+ 73	+ 4	- 12	+ 46	- 129	- 38	+ 7	+ 64	+129	+ 4	+ 18	-101	+ 57
East .. ..	- 83	- 38	+ 17	+ 12	- 48	- 510	-272	+ 13	+ 25	-125	- 8	+ 12	- 40	- 1,045
South-West .. ..	- 90	+ 42	- 20	- 17	- 77	- 645	-306	+ 61	- 23	-117	+ 26	+ 4	-179	- 1,341
Wales .. ..	+ 61	- 65	- 11	+ 8	+337	+ 84	- 83	+ 75	+ 71	+228	- 15	- 7	+102	+ 785
Wales I .. ..	+ 77	- 59	- 17	+ 12	+340	+ 208	- 76	+ 64	+ 81	+305	- 42	- 13	+125	+ 1,005
Wales II .. ..	+ 11	- 82	+ 11	- 3	+326	- 296	-106	+112	+ 41	- 9	+ 68	+ 11	+ 25	+ 109
Rates per cent. of those for England and Wales.														
South-East .. ..	24	88	83	84	42	75	96	87	75	81	93	98	92	81
Greater London .. ..	24	104	75	96	44	89	128	88	68	82	96	96	103	89
Remainder of South-East .. ..	23	63	95	63	39	53	45	86	87	78	89	102	76	69
North .. ..	171	121	124	118	144	134	120	106	118	113	102	81	114	120
North I .. ..	304	114	185	141	209	166	121	106	138	114	97	60	113	134
North II .. ..	196	88	149	106	146	132	90	104	109	112	85	85	100	114
North III .. ..	90	97	116	125	127	121	90	108	93	112	95	132	117	111
North IV .. ..	150	146	96	104	125	128	143	105	125	113	113	60	116	120
Midland .. ..	120	95	91	94	78	96	103	103	101	109	109	136	90	100
Midland I .. ..	133	71	85	102	57	99	108	103	92	110	112	134	90	100
Midland II .. ..	93	141	104	76	121	92	93	101	119	107	102	138	89	101
East .. ..	27	79	116	124	78	66	48	102	107	93	96	126	96	84
South-West .. ..	21	124	81	67	65	58	41	111	93	94	112	109	81	80
Wales .. ..	154	63	90	116	251	106	84	114	121	112	93	85	111	112
Wales I .. ..	168	67	84	124	252	114	85	112	124	117	80	72	113	115
Wales II .. ..	110	54	110	94	246	81	80	120	112	100	132	123	103	102

Mortality from bronchitis and pneumonia (considered jointly because of evidence of interchangeability between these forms of return) is very greatly and consistently in excess in the North of England. During the last fourteen years the Northern excess over the general average, 34 per cent. in 1931, has varied only between 24 and 41 per cent. Separation into the 4 sub-regions reveals a much greater excess in Northumberland and Durham, 66 per cent., than in the rest of the Northern area. In contrast with this the Eastern counties show a rate 34 per cent., the South-West 42 per cent., and the South-East outside Greater London 47 per cent., below the mean. Urbanization also is strongly associated with this as with most other forms of infant mortality. During each of the fourteen years 1917-30 excess for the county boroughs was recorded, varying from 11 to 28 per cent. while the rate for the rural districts was as constantly below the mean, the difference ranging from 14 to 35 per cent.

In 1931 (Table 14) the county boroughs outside Greater London showed a rate of 29 per cent. above, and rural districts 34 per cent.



below the mean mortality from this cause, the divergence being greatest at 9-12 months of age. Greater London, however, showed a rate only 89 per cent. of that in England and Wales.

Mortality from diarrhoea increases from South to North as noticed during the last fifteen years, but this sequence is profoundly modified by the extent of urbanization. Thus North IV, Lancashire and Cheshire, gave the highest rate, 43 per cent. in excess of the mean. Greater London followed with 28 per cent. excess, North I showed 21 per cent. excess while the other Northern regions gave rates 10 per cent. in defect. The slightly urbanized counties of the South and East gave rates from 52 to 59 per cent. below the mean. Table 14 indicates that the county boroughs showed an excess of 33 per cent. and the rural districts a rate 45 per cent. below that for all areas, the divergence being greatest at 3-6 months of age.

London diarrhoea mortality is uniformly high, the excess for the County over the general average having ranged during 1911-30 from 10 to 69 per cent. This excess has been greatest at 3-6 months, the age of highest diarrhoeal mortality, at which age London excess has ranged during 1911-30 from 13 to 117 per cent. In 1931 Greater London gave the highest rates for any region at 3-6 and 6-9 months, the excess over the general average being greatest at the latter period (54 per cent.).

The third chief cause of local differences in infant mortality, premature birth, is more closely associated with geographical position than with urbanization, but under the new regional division it is seen that Wales I gave a higher rate in 1931 than the North, the range being from 117 per cent. of the general average for this area to 82 per cent. for Greater London and 78 per cent. for the remainder of the South-East. The low London rates, which have been remarked upon in previous years, and the comparatively small difference between the rate of 19.89 for all county boroughs outside Greater London and 17.90 for the rural districts (Table 14) indicate the slight degree of association with urbanization.

Next to prematurity and bronchitis and pneumonia, which in each of the last eleven years (Table 12) have ranked as the principal causes of infant mortality, come, for 1931, congenital malformations, diarrhoea, congenital debility, and convulsions. 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 5.53 per 1,000 births in 1931, when for the first time it surpassed diarrhoea. This increase affects all sections of the population to much the same extent, but mortality in 1931 was highest in Wales and the South-West, and comparatively low in Greater London.

Congenital debility and convulsions, on the other hand, are seen from Table 12 to be steadily losing their old numerical importance, the rate for each in 1931 being only about 45 per cent. of the corresponding rate ten years earlier.

It may be presumed that much of this decline is due in each case to transfer to other forms of certification. Congenital debility is less frequently returned as a cause of death in Greater London than in any region, and the rate for the county boroughs is only slightly in excess of that for the rural districts, being actually lower during the first four weeks of life. The convulsions rate in 1931 in South-East England is only one-sixth of that in Wales, where it is regularly in excess. In England, however, with few exceptions this mortality decreases with much regularity from North to South.

The progressive increase in mortality attributed to congenital malformations, noticed in the Review for 1930, continued in 1931, the increase since 1921 amounting to 39 per cent. Wales gave the highest rate as in 1922, 1927, 1928 and 1930, but by the new sub-division of the South, which in nine previous years had shown the lowest rates, a higher rate is revealed in the South-West than in the other regions. Elsewhere there is a decrease from North to South-east. In Greater London the rate is low, as previously noticed for London County, and there is no urban excess (Table 14).

#### Mortality at Ages over One Year.

Table XV 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 1930 and 1931, and, in order to provide means of comparison with the most recent pre-war experience, for 1911-14.

As previously stated the 1931 rates are based upon the Census populations of that year, whereas those for 1930 are derived from the preceding Census (1921) and are somewhat over estimated at ages over 65.

Table XV.—England and Wales: Mortality from all Causes per Million Population, 1911-14, 1930, and 1931.

	Males.			Females.			Persons.		
	1911-14.	1930.	1931.	1911-14.	1930.	1931.	1911-14.	1930.	1931.
Crude All Ages:	14,890	12,268	13,033	13,065	10,680	11,615	13,948	11,441	12,284
Standardized { A ..	14,841	10,767	11,272	12,260	8,546	9,025	13,475	9,586	10,077
{ B ..	15,911	11,654	12,178	13,713	9,801	10,337	14,779	10,689	11,215
0 ..	40,588	20,458	22,416	33,917	16,004	17,454	37,270	18,255	19,962
5 ..	3,304	2,392	2,292	3,255	2,170	1,992	3,279	2,282	2,144
10 ..	1,972	1,578	1,464	2,055	1,516	1,475	2,014	1,547	1,470
15 ..	2,942	2,538	2,594	2,683	2,338	2,393	2,811	2,438	2,493
20 ..	3,721	3,119	3,325	3,200	2,776	2,891	3,450	2,948	3,102
25 ..	4,912	3,574	3,475	4,057	3,220	3,266	4,464	3,387	3,366
35 ..	8,033	5,725	5,700	6,437	4,305	4,514	7,205	4,951	5,086
45 ..	14,808	11,217	11,487	11,363	7,801	8,250	13,018	9,336	9,760
55 ..	29,767	22,980	23,861	22,471	16,555	17,673	25,905	19,596	20,605
65 ..	62,844	56,695	58,487	50,722	42,560	44,166	56,124	48,934	50,554
75 ..	135,480	129,695	138,867	114,126	106,311	115,073	122,694	115,433	124,526
85 and upwards ..	271,337	257,300	284,796	237,360	249,468	256,103	249,201	252,129	265,433

A. English Standard (Population of England and Wales, 1901). B. International Standard.  
(See pages 1 and 2.)



Although at most of the ages distinguished in Table XV, mortality was higher in 1931 than in 1930, at ages 5-15 for both sexes and at 25-35 for males it was lower than in the preceding year, and at every age-group under 75 for each sex it was lower than before the war.

**Table XVI.—England and Wales: Mortality at various ages from all causes in 1930 and 1931 per cent. of that for the same sex and age in 1911-14.**

	Males.		Females.		Both Sexes.	
	1930.	1931.	1930.	1931.	1930.	1931.
All Ages:						
Crude .. .. .	82.4	87.5	81.7	88.9	82.0	88.1
Standardized { A .. .	72.5	76.0	69.7	73.6	71.1	74.8
{ B .. .	73.2	76.5	71.5	75.4	72.3	75.9
0— .. .. .	50	55	47	51	49	54
5— .. .. .	72	69	67	61	70	65
10— .. .. .	80	74	74	72	77	73
15— .. .. .	86	88	87	89	87	89
20— .. .. .	84	89	87	90	85	90
25— .. .. .	73	71	79	81	76	75
35— .. .. .	71	72	67	70	69	71
45— .. .. .	76	78	69	73	72	75
55— .. .. .	77	80	74	79	76	80
65— .. .. .	90	93	84	87	87	90
75— .. .. .	95	102	93	101	94	101
85 and upwards.	95	105	105	108	101	107

The extent of the fall at the various ages can be better appreciated from Table XVI, in which the mortality in 1930 and 1931 is expressed as a percentage of the rate in the pre-war period 1911-14.

At "all ages" for both sexes the decline in the crude death-rate amounts to 12 per cent. (18 per cent. in 1930), which on standardization according to the English standard is increased to 25 per cent. (29 per cent. in 1930). The fall is much greater at 0-5 than at any higher age, amounting in 1931 to about 45 per cent. for males and 49 for females, while at the later ages the change in the male rate ranges from a decrease of 31 per cent. at 5-10 to an increase of 5 per cent. at ages over 85, and in the female rate from a decrease of 39 per cent. at 5-10 to an increase of 8 per cent. at ages over 85.

After infancy the fall very rapidly decreases with advancing age up to early maturity, reaching a minimum of 11 per cent. for males and 10 per cent. for females at 20-25. The extent of fall then increases to 29 per cent. for males at 25-35 and 30 per cent. for females at 35-45. Thereafter the decrease recorded becomes progressively less for each sex and disappears after 75.

Mortality at age 0-5 (Table XV) is very imperfectly measured during recent years by the crude rate for all these ages jointly. When the birth-rate is falling fast, as during the war and since 1920, the proportion to the whole group aged 0-5 of infants under one year of age is abnormally low, and the crude death-rate of the group tends to fall merely because the effect of the high mortality of these infants is less in consequence of their smaller numbers. When the birth-rate rises, the opposite effect is produced, and allowance by standardization for these changes in the composition of the population at risk increases the death-rate in the first case, and reduces it in the second.

Table XVII measures the effect of this influence of changes in the birth-rate upon the mortality of early life immediately before the war 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 46 per cent. shown for this mortality in Table XVI is seen to be slightly overstated from this cause, being reduced to 45 per cent. when allowance is made for its influence. But this influence, which was greatest during the years 1918-21, when its effect upon the crude rate varied from a reduction of 11 per cent. to an increase of 12 per cent., has become of less importance in recent years, its effect in 1931 being to increase crude mortality by 3 per cent. The crude rate, accordingly, as recorded in Table 5, now again provides a measure of the

**Table XVII.—England and Wales: Comparison of Crude and Standardized Death-Rates per 1,000 living at Age 0-5, 1911-14 and 1917-31.**

	Males.		Females.		Both Sexes.	
	Crude.	Standardized.	Crude.	Standardized.	Crude.	Standardized.
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	28.8	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	23.2	17.5	18.1	20.0	20.6



Table XVIII.—England and Wales:—Mortality per 1,000 living (both sexes) in each of the first Five Years of Life, 1911-14, 1930, and 1931.

Year of Life.	1911-14.	1930.	1931.	1931 per cent. of	
				1911-14.	1930.
0-1 .. ..	118.16	63.68	68.68	58.1	107.9
1-2 .. ..	34.06	13.72	15.62	45.9	113.8
2-3 .. ..	13.68	6.22	6.69	48.9	107.6
3-4 .. ..	8.32	4.17	4.40	52.9	105.5
4-5 .. ..	6.14	3.59	3.51	57.2	97.8
0-5 { Crude ..	37.27	18.25	19.96	53.6	109.4
{ Stand <sup>d</sup> ..	37.52	19.07	20.63	55.0	108.2
1-5 { Crude ..	15.62	6.87	7.53	48.2	109.6
{ Stand <sup>d</sup> ..	15.54	6.92	7.54	48.5	109.0

movement of this mortality sufficiently accurate for practical purposes. It is evident that recent rates are quite without parallel in the past, no quinquennium before 1911-15 returning less than double the rate for 1931.

**Mortality at 1-5.**—The causes of the great decline in mortality at 0-5 recorded in Table 5 have been for the most part already dealt with, as 70 per cent. of deaths under 5 in 1931 occurred in the first year of life. But, as shown by Table XVIII, 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 seem to call for some consideration.

The fall in proportionate annual rate of decline in mortality in recent years has generally been greater for these years of life than for the first year, although the experience of 1927 and also of 1929, proved to be exceptions to this rule. Table XVIII shows that compared with the pre-war period the decline in 1931 has been least in the first year and greatest in the second, decreasing continuously from the second to the fifth year of life. When compared with 1930, the rise was at its maximum in the second year, which showed the highest increase in 1929, followed by the greatest fall in 1930. This year of life was shown in the Review for 1923 (page 26) to be the age of maximum susceptibility to environment. The fifth year, in common with ages 5-15, showed an improvement in 1931 when compared with 1930.

The distribution throughout the country of mortality at these ages is shown in Table XIX, which may be compared with Table VI (Infant Mortality). The greatest excess over the general average recorded in Table XIX is for North I, which at ages 1-2 shows a rate more than three times, and at 2-5 over 2½ times, the corresponding rates for the Eastern region and the Southern

Counties excluding London. Next in order come the other regions of the North of England and the region of Wales I. The most favourable position at each age period is occupied by the South-East counties outside London, the outer ring of London, and the Eastern region, 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 in 1931 a mortality for the second year of life much below the general average, though this is not the case for the first year (Table VI).

Table XIX.—Distribution of Mortality in Early Childhood, 1931.

	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 ..	15.63	4.85	100	100
South-East .. ..	10.21	3.44	65	71
Greater London ..	11.41	3.70	73	76
Remainder of South-East.	8.26	3.04	53	63
North .. .. .	22.25	6.52	142	134
North I .. ..	29.64	8.11	190	167
" II .. ..	23.40	6.45	150	133
" III .. ..	17.76	6.28	114	129
" IV .. ..	21.29	5.96	136	123
Midland .. .. .	15.27	4.71	98	97
Midland I .. ..	16.18	4.97	104	102
" II .. ..	13.46	4.20	86	87
East .. .. .	8.84	3.17	57	65
South-West .. ..	10.21	3.37	65	69
Wales .. .. .	17.39	5.63	111	116
Wales I .. ..	19.48	6.06	125	125
" II .. ..	10.82	4.36	69	90
County boroughs* ..	21.39	6.06	137	125
Other urban districts* ..	14.91	5.11	95	105
Rural districts* .. ..	11.34	3.67	73	76
Greater Admin. County	13.28	4.15	85	86
London { Outer Ring ..	9.14	3.24	58	67

\* Excluding Greater London.

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 this range increases throughout the first year to 49-169 at 9-12 months (Table X) when each regional rate is expressed as a percentage of the rate for England and Wales. In the second year the range is still wider, 53-190, but at 2-5 years it has diminished again to 63-167.



The association with urbanization at these three age periods is reflected in the differences in Tables X and XIX between the percentage rates for London and its outer ring, amounting to 31 at 9-12 months, 27 at 1-2 years and 19 at 2-5, and by the corresponding differences between the county boroughs and rural districts, namely 61 at 9-12 months, 64 at 1-2 years and 49 at 2-5.

*Effect of Density on Juvenile Mortality.*—Frequent reference has been made in past years to this association between infantile and juvenile mortality and geographical situation on the one hand and urbanization on the other. The former has been examined hitherto by dividing England into three zones, North, Midlands and South, and treating Wales as a fourth area; the latter by dividing each area into aggregates of county boroughs, of smaller towns and of rural districts. The measure of urbanization has been, therefore, in effect, density of population per acre, as may be seen from the average densities on this basis at the Census of 1931, given in Table XX.

Table XX.—Density of Population per Acre and per Room in Regions, according to Class of Area, 1931.

	Mean No. of persons per acre, 1931			Mean No. of persons per room, 1931		
	County boroughs	Other urban districts	Rural districts	County boroughs	Other urban districts	Rural districts
North ..	18·26	3·66	·24	·909	·877	·859
Wales ..	9·81	2·48	·17	·874	·819	·791
Midlands ..	18·60	4·29	·27	·827	·792	·737
South ..	16·21	4·50	·26	·767	·706	·692

The mean densities per acre are least in Wales for each class of area, but in England they have no consistent relation with geographical position. It is commonly supposed that the descending progression of mortality rates from North to South, especially noticeable in childhood, is partly the result of climate, and partly of the impact of differing industrial conditions upon the children's health, acting directly through the accompanying housing environment and indirectly through the social constitution of the population which provides the children's parentage. It may be gathered from Table XX that it is unnecessary to suppose that climatic differences are of great importance, since a measure of the social and environmental conditions afforded by the mean number of persons per room shows in each class of area the same downward sequence, in the order North, Wales, Midlands, South, which is also the order characteristic of juvenile mortality rates.

Unlike the densities per acre, these densities per room exhibit an overlap in respect of the three classes of area, Northern urban

districts having a higher density than Midland county boroughs and so on, the sequence of the twelve aggregates when arranged in descending order of the mean number of persons in private families per living room according to the Census definition, being as shown in Table XXI. A close correspondence of this sequence with the order of magnitude of the mortality rates in the quinquennium 1926-30 is very evident at ages 1-2 and 2-5 years, and also with a few exceptions in the first year of life. Apart from the exceptionally good position of London mortality in comparison with its high housing density, at each of the ages only two or three of the other twelve rates are out of order in descending sequence. It may also be ascertained from the table that there is a much closer association between mortality and density per room when aggregates having similar average densities per acre are compared than there is between mortality and density per acre when aggregates having similar densities per room are compared.

Table XXI.—Mortality at 0-1, 1-2 and 2-5 Years of Age in 1926-30, in Aggregates arranged in order of Mean Persons per Room, 1931.

	Mean No. of persons per room, 1931.	Mean annual mortality, 1926-30.			Mean No. of persons per acre, 1931.
		0-1 per 10,000 live births.	1-2 per 10,000 living.	2-5 per 10,000 living.	
London Admin. County	·982	643	201	52	58·7
North, County boroughs	·909	860	282	74	18·3
North, Urban districts ..	·877	754	208	65	3·7
Wales, County boroughs	·874	752	188	57	9·8
North, Rural districts ..	·859	706	172	55	0·2
Midlands, County boroughs	·827	703	191	55	18·6
Wales, Urban districts ..	·819	744	177	56	2·5
Midlands, Urban districts	·792	586	141	48	4·3
Wales, Rural districts ..	·791	718	130	46	0·2
South, County boroughs	·767	573	143	49	16·2
Midlands, Urban districts	·737	554	110	39	0·3
South, Urban districts ..	·706	502	106	39	4·5
South, Rural districts ..	·692	485	94	32	0·3

In the present Review it must suffice to point this out. Although the social selection induced by localization of particular industries in an area may be more important than local housing conditions in producing overcrowding and at the same time enhancing child mortality, there can be no doubt that overcrowding *per se* has some measure of direct influence upon mortality in early childhood, though perhaps not in early infancy,



and since this density of population per room is to some extent susceptible of administrative control, further attention will be paid to this matter in subsequent Reviews.

*Causes of Juvenile Mortality.*—London mortality, both at 1-2 and 2-5 years, reached, in 1931, the lowest levels yet recorded, despite the fact that the infant mortality rate exceeded that of four previous years. In the Review for 1922, the very high London mortality rates in early childhood for that year were shown to arise from a conjunction of measles, whooping cough and diphtheria epidemics with a high pneumonia mortality. The London experience for each year from 1922-31, depicted in Table XXII, indicates that measles, whooping cough and pneumonia have been mainly 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. Measles was epidemic in the even years, and whooping cough in 1922, 1925 and 1929, whilst pneumonia mortality was largely enhanced by influenza in 1922, 1924 and 1929. Since 1922, when these causes were all operative at once, the highest rates have occurred in years when two or more of the causes were unusually fatal, 1924 (measles, influenza and pneumonia) and 1929 (whooping cough, influenza and pneumonia).

Table XXII.—Mortality from Various Causes at 1-2 and 2-5 years of Age in London Administrative County in each year 1922 to 1931.

	1-2 years.						2-5 years.		
	Death rate per 1,000 Living.						Death rate per cent. of England and Wales.	Death rate from all causes.	
	Measles.	Whooping cough.	Influenza.	Pneumonia.	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

The lowest rates have occurred in 1923, 1927 and 1931, the only years in which neither measles nor whooping cough were very prevalent. The disturbing factor of influenza affects other parts of the country to almost the same extent as London, and when the London rate is expressed in terms of that for England and Wales, the rise and fall of the ratio in even and odd years more clearly reflects the predominant influence of measles upon this relative mortality in London both at 1-2 and 2-5 years.

The chief causes of death in England and Wales at ages 1-5 are set forth in Table XXIII, which also provides comparison with 1930 and with 1911-14.

Table XXIII.—England and Wales : Deaths from Various Causes per Million living at Ages 1-5 Years in 1911-14, 1930, and 1931. (Both Sexes.)

Cause of Death.	Death-rate.			Cause of Death.	Death-rate.		
	1911-14.	1930.	1931.		1911-14.	1930.	1931.
7. Measles .. ..	2,673	1,142	923	105 : 2. Laryngitis ..	152	41	22
8. Scarlet fever .. ..	373	116	87	106. Bronchitis .. ..	872	221	260
9. Whooping cough .. ..	1,216	401	540	107. Broncho-pneumonia	2,170	1,228	1,779
10. Diphtheria .. ..	781	552	428	108 & 109. Pneumonia (Lobar and not otherwise defined).	866	343	448
11. Influenza .. ..	60	50	224	Other Respiratory Diseases	140	58	67
23. Tuberculosis of Respiratory System.	237	101	90	118 : 1. Inflammation of the Stomach.	94	20	32
24. Tuberculosis of Nervous System.	705	374	384	119 & 120. Diarrhoea and Enteritis.	1,639	276	271
25. Tuberculosis of Intestines and Peritoneum.	391	96	79	130. Acute Nephritis ..	89	31	28
26-32. Other Tuberculous Diseases.	288	130	114	157. Congenital malformations.	85	80	87
63 : 1. Rickets .. ..	172	78	80	181. Burns and Scalds ..	360	200	196
79. Meningitis .. ..	451	111	114	Other Violence .. ..	274	286	278
86. Convulsions .. ..	460	89	87	Other Causes .. ..	1,071	847	916
				All Causes .. ..	15,619	6,872	7,535

At these susceptible ages mortality decreased from 10,677 per million in 1929 to 6,872 in 1930, and rose again to 7,535 in 1931. The table shows the causes of this rise, which occurred at ages 1-4 and not in the fifth year. They are, as was the case with the fall of the preceding year, mainly respiratory, influenza furnishing the largest proportionate increase, broncho-pneumonia, whooping cough, pneumonia (lobar and undefined), bronchitis and other respiratory diseases also contributing. The recent decline in mortality attributed to inflammation of the stomach was interrupted in 1931 by an increase. Measles, scarlet fever, diphtheria and laryngitis showed decreases in 1931 following upon increases in the previous year.

Tuberculosis, excepting that of the nervous system, again declined, the rate for the intestinal and peritoneal form registering a fall for the eighth year in succession. The mortality at ages 1-5 from tuberculosis has fallen since 1911-14 to the extent of 80 per cent. for intestines and peritoneum, 62 for respiratory tubercle, 46 for the nervous system and 60 per cent. for other forms.

In Table XXIV the trend of the death-rate at ages 0-5 years in quinquennial periods since 1861 is indicated for tuberculosis of the nervous system, intestines and peritoneum, and all other forms combined. For the nervous system the fall has been continuous, the 1931 rate being less than one fifth of that in 1861-5. For intestines and peritoneum it has been continuous since 1876-80, 1931 mortality forming less than one-twentieth of the rate at that period. For other forms, including respiratory tubercle, the fall has been continuous since 1886-90, and for all forms combined the 1931 rate is 14 per cent. of the mean rate for the period 1861-80 before the rapid decline set in.

Among the greatest decreases since 1911-14, shown in Table XXIII, have been those of deaths figuring under certain forms



Table XXIV.—England and Wales : Mortality of Children under 5 years of age from Tuberculosis, 1861-65 to 1931.

	Nervous System.	Intestines and Peritoneum.	Other Sites.	All Sites.
1861-1865 .. ..	2.36	1.76	1.45	5.58
1866-1870 .. ..	2.09	1.96	1.32	5.36
1871-1875 .. ..	1.91	1.99	1.23	5.12
1876-1880 .. ..	1.91	2.08	1.34	5.33
1881-1885 .. ..	1.50	1.85	1.19	4.55
1886-1890 .. ..	1.41	1.76	1.27	4.44
1891-1895 .. ..	1.37	1.60	1.25	4.22
1896-1900 .. ..	1.27	1.32	1.06	3.65
1901-1905 .. ..	1.12	1.07	0.97	3.16
1906-1910 .. ..	1.01	0.79	0.81	2.61
1911-1915 .. ..	0.81	0.58	0.60	1.99
1916-1920 .. ..	0.68	0.39	0.47	1.55
1921-1925 .. ..	0.52	0.22	0.33	1.08
1926-1930 .. ..	0.44	0.14	0.28	0.86
1931 .. .. ..	0.43	0.10	0.23	0.75

of return now rapidly passing out of use, convulsions, meningitis and laryngitis heading the list. Diarrhœa and scarlet fever (with acute nephritis) have also fallen fast, but the acute specific infections, which accounted for 29 per cent. of the total mortality in 1931 still constitute a great risk at these ages.

**Mortality of the Aged.**—The rapid increase of late years in the relative magnitude of this section of the population forms an outstanding feature of our vital statistics at the present time. Persons over 70 years of age were 297 per 10,000 total population in 1911, 344 in 1921, and in 1931 are estimated at 426 per 10,000. The revised population estimates based on the 1931 Census figures now available indicate an increase, since 1921, of 5 per cent. at ages under 70, whereas that for ages over 70 is 31 per cent.

Compared with 1930, the increase in the mortality at ages over 70 is proportionately greater than the increase for "all ages". The increase is shared by influenza, heart and respiratory diseases, out of the causes distinguished in Table XXV, whilst the mortality attributed to old age and cancer shows a decline.

The total mortality at these ages has not shown any consistent tendency to change since 1911-20, but the death-rate attributed to heart disease has increased from 16.0 to 31.5 per 1,000, and to cancer from 9.0 to 11.3 per 1,000, while that attributed to bronchitis has decreased from 15.2 to 8.4 per 1,000, and to old age from 25.0 to 10.2 per 1,000. Mortality assigned to diseases of the blood vessels increased to a maximum in 1928 and has since tended to decrease. The movement in opposite

directions of the mortality from these related causes is to some extent due to observed changes in the fashion of certification. The terms myocarditis and myocardial degeneration are supplanting cardiac failure and syncope especially in conjunction with chronic bronchitis. Similarly the term cardio-vascular degeneration is being employed in place of the separate statement of arterio-sclerosis and cardiac disease. Both these changes tend to inflate the mortality from heart disease at the expense of arterio-sclerosis and bronchitis.

Table XXV.—England and Wales : Mortality over 70 Years of Age in 1911-20, 1921-30, 1929, 1930 and 1931, from the Chief Causes of Death.

	Deaths from each Cause per 1,000 Total Deaths.					Mortality per 1,000 Living.				
	1911-20.	1921-30.	1929.	1930.	1931.	1911-20.	1921-30.	1929.	1930.	1931.
MALES.										
Influenza (11) .. ..	20	26	49	9	23	2.3	2.8	6.2	0.9	2.6
Cancer (45-53) .. ..	81	107	103	122	113	9.4	11.8	12.9	13.0	12.6
Heart Diseases (90-95) ..	148	205	260	287	300	17.1	22.7	32.7	30.7	33.4
Disease of Blood Vessels, including Cerebral Hemorrhage (82, 96, 97, 99 and 100).	163	195	170	177	171	18.8	21.6	21.4	18.9	19.0
Bronchitis (106) .. ..	137	110	96	71	78	15.9	12.1	12.1	7.6	8.7
Pneumonia (107-109) ..	34	35	39	31	32	4.0	3.9	4.9	3.3	3.6
Chronic Nephritis (131 & 132)	29	29	32	36	33	3.3	3.2	4.0	3.9	3.7
Old Age (162) .. ..	222	140	100	100	87	25.7	15.5	12.6	10.7	9.7
Other Causes .. ..	166	153	151	167	163	19.0	17.2	18.7	18.0	17.9
All Causes .. ..	1,000	1,000	1,000	1,000	1,000	115.5	110.8	125.6	107.1	111.2
FEMALES.										
Influenza (11) .. ..	24	31	63	9	31	2.3	3.0	7.1	0.9	3.0
Cancer (45-53) .. ..	87	105	98	120	107	8.7	10.2	11.1	11.0	10.3
Heart Diseases (90-95) ..	153	223	275	308	315	15.2	21.6	31.0	28.3	30.2
Disease of Blood Vessels, including Cerebral Hemorrhage (82, 96, 97, 99 and 100).	157	181	157	179	164	15.5	17.6	17.6	16.4	15.7
Bronchitis (106) .. ..	149	117	109	70	87	14.8	11.4	12.3	6.5	8.3
Pneumonia (107-109) ..	32	34	39	30	33	3.2	3.3	4.4	2.8	3.2
Chronic Nephritis (131 & 132)	21	23	24	30	28	2.1	2.2	2.7	2.8	2.7
Old Age (162) .. ..	248	165	121	123	109	24.6	16.0	13.6	11.3	10.5
Other Causes .. ..	129	121	114	131	126	12.7	11.7	12.9	12.0	12.0
All Causes .. ..	1,000	1,000	1,000	1,000	1,000	99.0	97.0	112.6	91.9	95.9
PERSONS.										
Influenza (11) .. ..	22	29	57	9	28	2.3	3.0	6.7	0.9	2.9
Cancer (45-53) .. ..	85	106	100	121	111	9.0	10.8	11.8	11.8	11.3
Heart Diseases (90-95) ..	151	215	268	299	308	16.0	22.0	31.7	29.3	31.5
Disease of Blood Vessels, including Cerebral Hemorrhage (82, 96, 97, 99 and 100).	159	187	163	178	167	16.9	19.2	19.2	17.5	17.1
Bronchitis (106) .. ..	144	114	103	70	82	15.2	11.7	12.2	6.9	8.4
Pneumonia (107-109) ..	33	34	39	31	33	3.5	3.5	4.6	3.0	3.4
Chronic Nephritis (131 & 132)	24	26	28	33	30	2.6	2.6	3.3	3.2	3.1
Old Age (162) .. ..	237	154	112	113	100	25.0	15.8	13.2	11.1	10.2
Other Causes .. ..	145	135	130	146	141	15.3	14.0	15.3	14.5	14.3
All Causes .. ..	1,000	1,000	1,000	1,000	1,000	105.8	102.7	118.0	98.2	102.2



Increasing precision in certification is responsible for the substantial decline in the number of deaths from old age; between 1911-20 and 1931 the deaths so returned decreased from a quarter to a tenth of the total deaths over 70 years of age.

*Centenarians.*—Among the deaths registered during the year there were 91 of reputed centenarians, 15 of whom were males and 76 females. In the preceding three years the numbers were 84, 98 and 61 respectively. Particulars of the ages returned and of the classes of area concerned are given in Table XXVI.

Table XXVI.—England and Wales : Age at Death of Centenarians, 1931.

	Males.										Females.									
	100 and over	100	101	102	103	104	105	106	107	100 and over	100	101	102	103	104	105	106	107	108	
Greater London ..	—	—	—	—	—	—	—	—	—	15	4	5	2	2	1	1	—	—	—	
Remainder of South-East	1	—	—	1	—	—	—	—	—	22	7	8	—	2	1	2	1	1	—	
North ..	—	—	—	—	—	—	—	—	—	11	3	3	2	—	—	2	—	—	1	
Midlands ..	6	2	1	—	2	1	—	—	—	9	6	2	—	—	1	—	—	—	—	
East ..	3	2	1	—	—	—	—	—	—	7	3	2	1	1	—	—	—	—	—	
South-West ..	4	2	—	1	1	—	—	—	—	8	5	1	1	—	—	—	—	—	—	
Wales ..	1	1	—	—	—	—	—	—	—	4	2	1	—	—	—	—	—	—	1	
England and Wales ..	15	7	2	2	3	1	—	—	—	76	30	22	6	6	3	5	1	2	1	

#### 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), this being based upon the Revised (1929) International List of Causes of Death. For the last 3 months of 1930 a corresponding tabulation, but based upon the slightly different list of causes used in 1921-30, is given in Appendix B. Tables 23 and Appendix B differ 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. 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 changes in the short list consist mainly in the addition of syphilis, general paralysis of the insane and tabes dorsalis, aneurysm, diseases of the liver other than cirrhosis, digestive and circulatory diseases not separately grouped, and senility as new items, and the omission of small-pox, rheumatic fever and arterio-sclerosis. The

changes in the International List are set out in Appendix C, and, in so far as they affect comparison with previous years, are referred to in the discussion of each cause of death.

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.

In Table 24 deaths of civilians 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.

In addition to the above tables, which relate exclusively to the year 1931, Table 6 contains a statement of the number of deaths registered in each year 1921-31 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 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, and not for both sexes jointly. Tables Nos. 11 and 12 state the mortality during the eleven years 1921-31 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 1931 was 251. Of these, 66 or 26 per cent., were ascribed to paratyphoid infection, as against 56, or 18 per cent., in 1930, and only 6, or 0.25 per cent., in 1911, the first year for which the information is available.

The standardized rates corresponding to these deaths, 6 per million persons living (Table 9), 7 for males and 5 for females (Table 8), are the lowest yet recorded.

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



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 60 times that for 1931.

The history of this remarkable fall is recorded in Table 9, with allowance by standardization for changes in the type of population at different periods, but mortality from this cause is little affected by standardization, the crude rate (Table 7), for each year from 1921 on, being almost the same as the standardized (Table 8). The rate remained almost stationary at about thirty times the present figure during the last decade of last century, when diarrhoeal mortality was also heavy (Table IV), then fell from 198 in 1899 to 15 in 1919, and then, after a further pause, from 13 in 1924 to 6 in 1931.

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

Table XXVII.—Typhoid and Paratyphoid Fevers, 1931: Mortality, Prevalence and Fatality†.

	Mortality per million civilian population.	Cases per million civilian population.	Deaths per 1,000 cases.
England and Wales .. ..	6	57	109
South-East .. .. .	5	70	70
Greater London .. ..	5	52	97
Remainder of South-East ..	5	99	47
North .. .. .	8	53	143
North I .. .. .	14	96	143
" II .. .. .	8	40	196
" III .. .. .	8	44	171
" IV .. .. .	5	45	119
Midland .. .. .	5	49	112
Midland I .. .. .	5	46	105
" II .. .. .	7	54	123
East .. .. .	11	60	183
South-West .. .. .	4	51	88
Wales .. .. .	6	38	162
Wales I .. .. .	6	30	193
" II .. .. .	7	61	119
Density Summary :—			
County Boroughs* .. ..	5	44	114
Other Urban Districts* ..	7	77	91
Rural Districts* .. ..	8	57	149
Greater } Admin. County ..	5	45	122
London { Outer Ring ..	4	59	75

\* Excluding Greater London.

† Excluding non-civilian cases and deaths but including cases in Port Sanitary Districts.

The highest mortality rate for 1931 for any region is that for North I. The Eastern region follows next, and the South-West shows the lowest rate. Excess of mortality in the small towns has been the general rule during the preceding twenty years, but in 1931 the rural districts outside Greater London had a rate of 8 per million, the small towns 7, and county boroughs 5.

Prevalence (Table 26) and fatality (Table XXVIII) were much the same in 1931 as in other recent years, though both have decreased greatly from the levels of 20 years ago. Their distribution throughout the various regions in 1931 is also shown in Table XXVII.

Prevalence was highest in the Remainder of South-East, and higher in North I, East, and in Wales II, than elsewhere. Fatality was highest in North II, Wales I and the East, and lowest in the South-East. The proportion of paratyphoid to total notifications ranged from 10.1 in Wales, 21.9 in the North, 29.4 in the South-West, 34.1 in the Midlands, 36.7 in the East, to 48.7 per cent. in the South-East.

The highest mortality rates recorded in Table 10 are, for counties of over 100,000 population, 16 per million in Durham and Norfolk. The county boroughs with highest rates are Grimsby (33), Tynemouth and Exeter (31), and West Hartlepool (highest in 1929 and 1930), 29.

6. Small-pox.—The deaths allocated to this cause numbered 9, a smaller number than in any of the preceding five years (Table 6). The mortality record for this disease is contained in Table 9, which shows that the standardized rate for 1931 was less than 0.5 per million, indicated by 0 in the table, as in fourteen other years since the 1901-05 epidemic. In the remaining eleven of these years the rate has been one per million.

Of the 9 deaths classed to small-pox, no associated disease was mentioned in three, a male aged 75 and two infants aged 1 week and 1 month. An infant 7 days old was certified as dying from inanition due to small-pox in utero, an unvaccinated girl aged 7 from encephalomyelitis due to small-pox, and a male aged 65 from lobar pneumonia due to small-pox. For the remaining three small-pox was stated as a contributory cause, the allocation to this heading being in accordance with the rule giving preference to the infectious disease. These were a female infant of 6 months with septicæmia due to cellulitis of the leg, a male aged 55 with broncho-pneumonia, and a male of 63 with cardio-vascular degeneration and chronic bronchitis.

The type of disease prevalent in 1931, though not specified in the records, is indicated by the low fatality rate of 1.6 per 1,000 notified cases (Table XXVIII). Since 1923, when it suddenly fell from 27.7 to 2.8 per 1,000 cases, the rate has shown but slight fluctuations, reaching 4.3 in 1928.



Table XXVIII.—England and Wales : Fatality of certain Infectious Diseases (Deaths per 1,000 Notified Cases), 1911-31\*.

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

\* 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 of small-pox cases in some years are too small to yield significant rates, but their basis of fact can be inferred from Table 6, and the rates quoted serve to bring out the extremely mild type of disease prevalent in 1921-31. 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 XXVIII. 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.

The notified cases numbered 5,664, compared with 11,839 in 1930, and 10,967 in 1929, and of these, 45 per cent. occurred in the South-East region and 42 per cent. in the East Midland region. The counties (with county boroughs) returning highest rates of prevalence, with the rates per 1,000 population in each case, are found from Table 29 to have been—Leicestershire, 3.83; Essex, 0.57; Lincolnshire (Lindsey), 0.36; London, 0.33; and Derbyshire, 0.32.

7. Measles.—The deaths registered from this cause numbered 3,288 corresponding to a mortality of 82 per million population. But allowance for decreased proportion of children in the present population increases the rate on standardization from 92 to 131 for males and from 73 to 114 for females. The death-rate for children under 15 years of age, 341 per million, is seen from Table 9 to have been the lowest with the exception of 1919 (334), 1921 (212) and 1926 (340). During last century this rate was on

an altogether higher level. Changes in the seasonal curve of mortality are discussed in the section on "Seasonal Distribution of Mortality." (Page 100.)

The distribution throughout the country of mortality from measles is stated in Table XXIX in the form of death-rates per 100,000 living at ages 0-5. Deaths at these ages in 1931 formed 89 per cent. of the total, and statement in this form prevents the comparison being prejudiced by varying proportions of children in the populations compared.

Table XXIX.—Measles and Whooping Cough, 1931 : Mortality at Ages under 5 Years, and Proportion of Deaths occurring in the First One or Two Years of Life.

	Measles.		Whooping Cough.	
	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 ..	98	60	81	45
South-East .. ..	22	56	68	47
Greater London ..	22	63	82	47
Remainder of South-East ..	22	47	46	47
North .. ..	169	63	103	42
North I .. ..	311	60	111	37
" II .. ..	164	66	71	44
" III .. ..	116	55	76	45
" IV .. ..	137	68	123	43
Midland .. ..	111	59	75	45
Midland I .. ..	132	59	82	43
" II .. ..	71	60	62	53
East .. ..	23	35	59	47
South-West .. ..	37	34	85	52
Wales .. ..	147	63	52	44
Wales I .. ..	167	63	55	44
" II .. ..	86	63	41	45
County boroughs* ..	171	63	105	42
Other urban districts* ..	97	58	71	45
Rural districts* ..	52	55	52	50
Greater London { Admin. County ..	36	68	99	46
{ Outer Ring ..	7	40	62	49

\* Excluding Greater London.

This table demonstrates, as usual, to what an extent measles mortality is promoted by city life. The increase shown for 1931 from rural districts to small towns, and from these to county boroughs, is common to the experience of each of the 21 years, 1911-31, for



which the facts are available. Since 1931 was not an epidemic year in London (Table XXII) the mortality rate there had a low value characteristic of inter-epidemic years, being also the lowest yet recorded. The mean rate for the last five even years has been 302, and for the five odd years, 1923-1931, it has been 60 per 100,000 at ages 0-5. The effect of urbanization, even when measles is not epidemic, is shown by the lower mortality in London's outer ring.

The rule of increase from South to North is clearly indicated by the regional rates, Wales I being exceptional. The sensitiveness of measles mortality to environmental conditions is reflected in the fact that the rate for North I is approximately fourteen times that for the Eastern and South-Eastern regions.

The increase of mortality from rural districts to large towns in 1931 was as usual accompanied, and presumably largely explained, by a higher average age at death in the former than in the latter. The proportion of total deaths occurring at ages under two years is seen from Table XXIX to increase from the rural districts to the large towns, and to be lower in the South and East than elsewhere.

The effect of sparseness of population in delaying infection by measles is here involved, for though there are no national records of the ages of children attacked, there must be a tendency where attacks occur earliest in life for the proportion of deaths during the first two years to be greatest. As the differential fatality of measles for young children is well known, the lower mortality rates of the rural districts must also be partly explained by later infection.

Table 10 shows that, of administrative counties with over 100,000 population, Durham returned the highest death-rate, 255 per million, or 3 times the rate in England and Wales, Northumberland 201, and Monmouth 158, coming next. The highest county borough rates were—Sunderland 576, Barnsley 527, and Newcastle upon Tyne 455.

8. **Scarlet Fever.**—Mortality from this cause was lower in 1931 than in any previous year.

Table 9 shows that for sixteen years in succession the rate at ages under 15 has been much lower than any recorded previous to this period (*i.e.*, to 1916), the mortality being now trifling compared with that prevalent a generation ago.

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. Thus the mortality of 1931 was less than 2 per cent. of that experienced 60 years earlier.

Table XXVIII shows that the fatality of cases of this disease was 6.6 in 1931, compared with a mean rate of 6.7 per 1,000 cases notified in the preceding five years. This rate is only about 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.

Table XXX.—Scarlet Fever and Diphtheria, 1931: Mortality at Ages under 15 Years, Prevalence and Fatality at All Ages. (Civilians only.)

	Scarlet Fever.				Diphtheria.		
	Deaths per 100,000 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 100,000 living at 0-15.	Cases per 100,000 living at all ages.	Deaths per 1,000 cases notified.
England and Wales ..	45	205	7	43	259	126	53
South-East .. .. .	50	224	7	37	219	135	40
Greater London .. .	58	262	6	41	242	164	35
Remainder of South-East	37	162	8	29	184	88	54
North .. .. .	56	213	7	52	329	122	70
North I .. .. .	51	232	7	44	136	64	62
" II .. .. .	52	172	9	40	409	142	77
" III .. .. .	63	216	8	55	371	119	79
" IV .. .. .	54	213	6	55	372	141	66
Midland .. .. .	18	175	4	31	197	110	49
Midland I .. .. .	18	173	4	32	219	126	48
" II .. .. .	17	180	4	29	153	79	51
East .. .. .	29	171	6	30	204	86	67
South-West .. .. .	22	131	7	28	194	93	50
Wales I .. .. .	68	228	9	52	335	197	50
Wales II .. .. .	67	254	8	55	311	186	49
" II .. .. .	73	153	13	43	411	229	51
County boroughs* .. .	44	221	5	50	336	149	58
Other urban districts* ..	49	178	8	44	226	100	59
Rural districts* .. .	30	158	7	32	196	87	64
Greater Admin. County..	59	277	6	49	259	195	31
London (Outer Ring .. .	57	244	7	33	223	129	43

\* Excluding Greater London.

In the experience of the last 21 years mortality tends to increase with urbanization for England and Wales generally, and from South to North for a given class of area. In 1931 the new form of distribution recorded in Table XXX shows the highest rate in Wales, followed by London and the North, and the lowest in the Midlands and South-West. Mortality according to the density classification was highest in London and lowest in the rural districts, but was higher in the small than the large towns. Increase, for the country as a whole, with urbanization, from rural districts to county boroughs, occurred in each of the preceding 21 years except 1918 and 1926.

Table XXX shows that, as has usually been the case in recent years, prevalence was at a maximum in London. Elsewhere it was highest in Wales I and in the North and lowest in the South-West. The fatality ratio was lowest in the Midlands and highest in Wales II.



Broadly speaking, about half the deaths from scarlet fever are of young children under 5 years of age. In 1931 this proportion, 43·0 per cent., was lower than in any year, except 1929 and 1930, since the record of age at death started in 1848. During last century it was much higher than of late years, varying from 60·1 (1893) to 68·3 (1895). For 1901-05 and the five succeeding quinquennia it stood as follows:—60·6, 58·4, 54·0, 48·4, 48·6 and 42·4. The progressive reduction to the level of recent years has contributed to the remarkable fall of mortality recorded in Table 9, later incidence involving greater prospect of recovery.

In Table XXXIV of the Review for 1928 the proportion of deaths at 0-5 was shown to have consistently increased, in the past, from rural districts to county boroughs, generally reaching its maximum in London, and along with this a general tendency to increase from South to North was noted for each class of area.

Table XXX shows that in 1931 the juvenile ratio was highest in North IV and III (Lancashire, Cheshire and the West Riding), and in Wales I, and lowest in the Southern, Eastern and Midland counties, where about 30 per cent. of all deaths occur at ages 0-5. Considered in relation to density it is lowest in the rural districts and London's outer ring, and highest in the large towns and in London itself.

Table 10 shows that, amongst counties with over 100,000 population, mortality was highest in Denbighshire (64 deaths per million as compared with an average of 14 for all counties) and Yorkshire, North Riding (34). Denbighshire also showed the highest rate in 1929 and 1930.

The highest rates amongst the county boroughs (average 12) are those of Warrington (162) and Portsmouth (52).

**9. Whooping Cough.**—The deaths allocated to this heading numbered 2,512 (1,112 males and 1,400 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 1931 are 135 at 0-3 months, 89 at 3-6 months, 112 at 6-12 months, and 128, 161 and 185 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. The increasing female excess after 3-6 months, at which age there is little difference between the sexes over a period of years, has been a constant feature of the records of the last four decades.\*

The death-rate of 263 per million living at ages under 15 is lower than in any previous year except 1919 and 1930. The mortality from this cause reached a maximum of 1,511 per million living at ages under 15 for the five years 1866-70, since when, with

\* Journal of Royal Statistical Society. xcvi, p. 248, 1933.

a single exception, it has progressively declined to 387 in 1926-30, and 263 in 1931, the total decline over the whole period amounting to 83 per cent. (Table 9).

The distribution of mortality from this cause at ages under 5 and the proportion of deaths under 1 year of age are indicated in Table XXIX.

The rule of increase of mortality with urbanization was maintained in 1931, the county borough rate being double that for the rural districts; mortality in London was also higher than in the outer ring. The regions North I and IV gave a high rate, and Wales II and the South-East, excluding London, showed the lowest mortality.

Table XXIX shows also the proportion of total deaths occurring in the first year of life in the country as a whole and in the different regions and classes of area. In 1931 the decline in the proportion with increasing urbanization from rural districts to county boroughs, shown in previous Reviews to have been the rule in every year since 1911 except 1930, was again evident in 1931. The East Midland and South-West regions gave the highest proportions and North I the lowest.

**10. Diphtheria.**—The 2,673 deaths in 1931 include 1,338 males and 1,335 females. An excess of males has not occurred since 1922. A female excess is usually shown also by the standardized death-rates (Table 8), indicating that the risk of death is actually somewhat greater for females, though the crude death-rate (Table 7) is generally higher for males. For 1931 the crude rates were 70 and 64 per million for males and females respectively, and the standardized rates 91 and 90.

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. With the exception of a fall in 1927, the rates continually increased from 1924, when the mortality reached its lowest level (231 per million), to 1930, when it reached 340 per million. The rate for 1931, 259 per million aged 0-15, is lower than in any year except 1923, 1924 and 1927, and is less than one-fifth of the maximum rates during the years 1856-65, or one-fourth of that forming the secondary peak of 1893.

Table XXX shows that diphtheria mortality was highest in the Northern regions II, III and IV and in Wales and lowest in North I. In the rest of England, excluding London, it varied little.

For the country as a whole, outside London, the rate in 1931 increased regularly with urbanization, as also in twelve of the twenty preceding years (1911-30) for which this comparison can be made. The rate for London, the same as that for the country



as a whole, was also in excess of that for London's outer ring. Of late years diphtheria has been chiefly an urban disease, though during the first 26 years of its recorded mortality in this country, 1855-80, this was greatest in the less densely populated areas. Possibly the disease was earlier recognised in the towns than in the country. There is, indeed, much evidence to suggest that diphtheria is still much more freely returned in some sections of the population than in others. Thus the frequency of its notification is greatest in London in each of the years 1916-30, and in 1931 the London rate was only exceeded in Wales II (Table XXX). The notification rate was relatively high in the North II and IV regions, and also in the West Midland region.

The ratio of deaths to cases notified ranged from 31 per 1,000 in London to 77 and 79 in North II and III, but was uniformly about 50 per thousand throughout Wales, the Midlands and Southern regions excluding London. The London ratio has been lower than in any other section of the population in each of the last seven years, and this suggests a varying standard of diagnosis. Apparently, in the North of England fewer deaths from diphtheria are preceded by notification, and therefore those so certified must form a larger proportion of the notifications. In London, on the other hand, notification reaches its maximum.

It may be gathered from Table 26 and Table 7 that whilst prevalence, as measured by notifications per 100,000 persons of all ages, has increased from 142 in the quinquennium 1911-15 to 151 in 1927-31, mortality in the same period has fallen from 14.0 to 7.9 per 100,000 of all ages, and the fatality ratio has consequently declined from 99 to 52 per 1,000 cases notified. Increasing use of bacteriological diagnosis and completeness of notification has undoubtedly exaggerated this apparent decline in the fatality rate.

Table 10 shows that the counties of highest mortality in 1931 were Denbighshire (236 per million), also highest in 1930, Flintshire (134), Merionethshire (118) and Glamorganshire (110). The highest rates among county boroughs (average 85) are those for Wakefield (404), Kingston-upon-Hull (295) and Ipswich (273).

11. **Influenza.**—The deaths assigned to this cause numbered 14,409, 6,899 of males and 7,510 of females. The resultant crude mortality rate of 360 per million, is reduced on standardization, by allowance for the increased age of the population, to 284 (Table 9), 304 for males and 265 for females (Table 8). Since 1900 these rates have been exceeded only in the years 1918-19, 1922, 1924, 1927 and 1929, which stand out in Table 9 and Table XXXI as epidemic years. The rates are considerably higher than the experience prior to the 1890 epidemic when the average annual rate for the 15 preceding years (1875-1889) was about 6 per million, ranging from 19 in 1875 to 2 per million in 1889.

Attention has been drawn in previous Reviews to the heavy mortality in the first quarter of the year. In this respect the experience of 1931 is much the same as in other years since the great epidemic of 1918-19, the mortality in the latter nine months of the year being subject to much slighter annual fluctuation than that in the first quarter, as shown in Table XXXI.

Table XXXI.—England and Wales, 1921-31 : Influenza Mortality per million Population during the first 3 and last 9 Months of each Year.

	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

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

The highest regional rate is that for Wales II, followed by North IV, the South-West, Wales I and the rest of the Northern region, while the lowest rate is that recorded for Greater London. Mortality generally was highest in the rural districts, decreasing with urbanization to a minimum in London, the rate in the Administrative County being almost the same as in the Outer ring.

In this respect the mortality from influenza contrasts with the incidence of the infantile epidemic diseases which follow an almost constant rule of increase with urbanization and from the South to the North. In 15 of the 21 years, 1911-31, for which comparison is possible, the highest mortality from influenza has been recorded in the rural districts and was a constant feature of the returns from 1911 to 1917 inclusive. In only two (1918 and 1920) of the 21 years did the mortality follow the rule of increase with urbanization. In 1931 an increase from South to North, and also from East to West is evident. The general epidemic experience of increase from South to North has occurred in eight of the 13 years following the great epidemic, but in six of the seven years 1911-17 the increase was from North to South. London has returned the lowest mortality in seven of the last eight years and in no year has the highest mortality been recorded in the Metropolis.



Table XXXII.—England and Wales, 1931: Influenza—Civilian Mortality. Encephalitis Lethargica—Civilian Mortality, Prevalence and Fatality.

	Influenza.	Encephalitis Lethargica.		
	Deaths per million living.	Deaths per million living.	Cases per million living.	Deaths per 100 cases notified.
England and Wales ..	361	24	16	147
South-East .. ..	282	18	13	137
Greater London ..	257	15	9	158
Remainder of South-East	322	23	19	121
North .. .. .	416	32	18	179
North I .. ..	400	28	10	270
" II .. ..	409	20	20	100
" III .. ..	336	19	11	176
" IV .. ..	467	44	25	179
Midland .. .. .	350	22	16	136
Midland I .. ..	346	20	16	122
" II .. ..	358	25	15	167
East .. .. .	363	20	24	86
South-West .. ..	457	28	25	110
Wales .. .. .	449	21	14	146
Wales I .. ..	424	18	14	130
" II .. ..	518	28	15	190
County boroughs* ..	362	29	20	144
Other urban districts* ..	401	27	18	152
Rural districts* .. ..	411	21	15	140
Greater Admin. County.	257	12	9	128
London { Outer Ring ..	256	18	9	192

\* Excluding Greater London.

The separate tabulation of deaths from influenza with stated respiratory complications (mostly pneumonia) affords the means of comparing the varying proportions of deaths so returned in the several classes of area.

Table XXXIII.—Deaths from Influenza with stated Respiratory Complications (11*a*) 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

It will be seen from Table XXXIII that the proportion is lowest in the rural areas and increases with urbanization to a maximum in London, so that the frequent rural excess of total mortality from influenza, especially in years of low mortality, is partly due to the higher mortality in this class of area from influenza without statement of respiratory disease. This excess of recorded mortality from uncomplicated influenza in rural areas suggests a wider connotation of the term than in urban practice. During the great epidemic of 1918-19, the proportion of influenza deaths with respiratory complications varied but little in the several classes of area, ranging only from 85 per cent. in London to 78 per cent. in the rural areas. In the last six years, lower proportions in all classes of area have characterized those years when influenza was not epidemic, namely 1926, 1928 and 1930. The influence of influenza epidemics on mortality from other diseases is also referred to in the section on Seasonal Distribution of Mortality. (Page 100.)

16. **Acute Poliomyelitis.**—The recent decline in mortality and prevalence of this disease from the high level reached in 1926 was continued in 1931. Deaths, including those from acute polioencephalitis, number 98, the smallest total recorded since the disease was first distinguished in the tabulation for 1911. The standardized death-rate of 2.7 for females was the lowest recorded, and that of 3.8 for males was the lowest save in 1922 and 1923. The cases notified, numbering 341 of poliomyelitis and 55 of polioencephalitis, were less than in any year since 1922 (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 962, 496 of males and 466 of females, yielding standardized death-rates of 23 per million for males and 20 for females. For females this is the lowest rate since 1923 (Table 8). The 654 notifications (Table 28) show a decline for the seventh year in succession, and are considerably less than deaths, yielding a fatality ratio of 1,471 deaths per 1,000 notifications. This ratio has exhibited wide fluctuations since 1919, reaching 742 per 1,000 notifications in 1922, thereafter declining rapidly to a minimum of 279 in 1924, and then rising in each successive year to 1,471 in 1931. This later increase is probably due to the inclusion from year to year of an increasing number of deaths from chronic forms of the disease contracted in earlier years which tends to vitiate the relation between the deaths registered and the new cases of the disease notified during the year. It is also probable that some deaths certified as due to the disease were not recognized and notified as such during life.

Table XXXII shows that prevalence was highest in North IV (Lancashire and Cheshire) and in the South-West and East; in London fatality and more especially prevalence are, as in earlier years, below the general average and the table suggests the likelihood that the disease may be very much over-diagnosed elsewhere.



As in each of the eight preceding years the highest mortality in 1931 was recorded in the North. The London rate, on the other hand, has been generally below average, its percentage ratio to that for England and Wales since 1921 having been as follows:—1921, 84; 1922, 122; 1923, 79; 1924, 92; 1925, 80; 1926, 59; 1927, 59; 1928, 41; 1929, 54; 1930, 70; 1931, 50 (62 for Greater London).

18. **Cerebro-spinal Fever** (*Meningococcal Meningitis*).—Deaths from this cause numbered 1,440, including 46 of non-civilians. Of these 863 were of males and 577 of females, corresponding to standardized rates of 54·8 and 37·3 per million. These rates are in excess of the preceding year by 132 per cent. for males and by 105 per cent. for females, the male rate being the highest since 1917, and the female rate highest since 1915. As may be seen from Table XXXIV, the standardized rates at all ages, which rose suddenly to high levels in 1915 and remained high till 1917, then declined progressively to 1923 and 1924, but thereafter increased again, almost reaching in 1931 the level of 1915–17 for males, and surpassing it for females. It is seen that, for females, 1915–17 mortality rates were highest at ages under 5 and declined with advancing age, but for males there was superimposed upon this relation to age a high mortality in young adults associated with their unusual conditions of segregation in the war period. This must be borne in mind in considering the subsequent male ratios at 15–25 in the Table.

Table XXXIV.—England and Wales, 1911–31: Cerebro-spinal Fever. 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	54·8	219·3	51·3	54·1	17·5	37·3	172·9	45·9	17·4	9·3
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	126	70	89

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

Both for males and females at ages under 5 the death-rate fell by 1923-24 to a minimum of 31 per cent. of the 1915-17 level, whereas at 5-15 it fell below 20 per cent. and at ages 25 and upwards below 10 per cent. It may be recalled in this connection that, whereas in years since 1922 none of the 0-5 group and a diminishing number of the 5-15 group had been previously exposed to a period of high prevalence, all at ages 15 and upwards had been so exposed. The downward trend of mortality with advancing age became increasingly pronounced until 1922, but since 1929 it has become less steep. In 1931, while mortality at 0-5 is more than 40 per cent. in excess of that in 1915-17, and is in excess also at 5-15, it fails to attain the levels of those years at higher ages.

Notifications in 1931 numbered 2,216, in which were included 59 non-civilians (Table 28), this having been exceeded only in

Table XXXV.—Cerebro-spinal Fever, 1931: Mortality, Prevalence and Fatality.

(Civilians only.)

	Deaths per Million Living.	Cases per Million Living.	Deaths per 100 Cases.
England and Wales .. ..	35	54	65
South-East .. .. .	21	26	80
Greater London .. ..	25	30	83
Remainder of South-East	15	19	75
North .. .. .	63	103	61
North I .. .. .	72	114	63
" II .. .. .	26	35	75
" II .. .. .	134	248	54
" IV .. .. .	27	31	85
Midland .. .. .	30	51	59
Midland I .. .. .	16	19	83
" II .. .. .	59	113	52
East .. .. .	15	17	87
South-West .. .. .	12	15	83
Wales .. .. .	11	13	88
Wales I .. .. .	12	12	100
" II .. .. .	10	16	64
County Boroughs* .. ..	39	57	68
Other Urban Districts*	36	63	57
Rural Districts* .. ..	38	62	62
Greater Admin. County ..	30	41	74
London { Outer Ring .. ..	19	18	106

\* Excluding Greater London.



1915 and 1917. The numbers in the preceding 5 years were 394, 472, 413, 667, 674. The fatality ratio, 65 per 100 cases, is the same as in 1915-17, but much below that in recent years, the ratios in the 5 years preceding 1931 being 93, 91, 106, 88 and 94. 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 cases which occurred than at other times.

Prevalence was greatest in the spring with a maximum in April (Table 27), mortality being greatest in March (Table 23).

The mortality distribution outside London manifested in 1931 no relation to urbanization, but Table XXXV shows that both mortality and prevalence increased in general from South to North and from West to East, being highest in North III, followed by North I and Midland II, lowest in Wales and lower in the South-West than the South-East. The fatality ratio of deaths to notified cases was lowest in the two regions with greatest prevalence and mortality, and highest where the disease was least prevalent, which again suggests that notification is more complete during local epidemics.

23-32. Tuberculosis.—The deaths assigned to tuberculous affections in the aggregate number 35,818—19,941 of males and 15,877 of females—68 more than those so classified in the previous year.

The standardized death-rate resulting from these figures, 869 per million persons (males 976, females 771), is the lowest yet recorded (Table 9), and is 3 per million below the previous lowest rate in 1930, the male rate being 2 per million higher and the female rate 10 per million lower than in that year.

Table XXXVI.—England and Wales: Mortality from Tuberculosis (All Forms) per Million Population, 1912-14, 1929, 1930 and 1931.

All Ages	Crude Standardized	Males.				Females.				Persons.			
		1912-14	1929	1930	1931	1912-14	1929	1930	1931	1912-14	1929	1930	1931
		1,571	1,122	1,037	1,041	1,169	809	770	762	1,364	959	898	896
1,542	1,057	974	976	1,174	820	781	771	1,349	932	872	869		
0-	2,081	935	818	827	1,717	762	685	680	1,900	849	752	754	
5-	572	301	270	276	580	293	302	250	576	297	286	283	
10-	447	278	224	216	687	384	350	328	568	331	286	272	
15-	939	787	777	788	1,226	1,156	1,157	1,143	1,084	971	967	966	
20-	1,501	1,225	1,165	1,235	1,381	1,472	1,361	1,349	1,439	1,349	1,263	1,294	
25-	1,816	1,298	1,240	1,212	1,403	1,172	1,154	1,129	1,599	1,231	1,195	1,169	
35-	2,189	1,390	1,402	1,437	1,374	840	793	824	1,767	1,182	1,070	1,106	
45-	2,384	1,819	1,667	1,626	1,185	669	616	619	1,762	1,205	1,104	1,089	
55-	2,213	1,448	1,341	1,363	967	555	528	528	1,553	979	913	924	
65-	1,378	986	931	854	752	481	418	437	1,031	708	649	623	
75 and up	586	411	389	360	440	290	284	290	498	337	325	317	

It will be seen from Table 9 that epidemics of influenza tend to arrest the decline in tuberculosis mortality, while in the year following the epidemic the death-rate shows a substantial fall.

This fluctuation of the decline may be caused by tuberculous persons succumbing to influenza, who would otherwise have survived for a longer period.

The decline, as shown in Table XXXVI, was arrested in 1931 at ages 0-10, 15-25, 35-45 and 55-65 for males, and at all ages over 35 for females.

In order to give a somewhat longer range view of the reduction of tuberculosis mortality as it affects individuals of varying sex and age, Table XXXVII is continued from previous reviews.

Table XXXVII.—England and Wales: Mortality from Tuberculosis in 1931, per cent. of that in 1912-14.

All Ages	Crude Standardized	Males.	Females.	Persons.
		66	65	66
0-	.. ..	40	40	40
5-	.. ..	48	43	46
10-	.. ..	48	48	48
15-	.. ..	84	93	89
20-	.. ..	82	98	90
25-	.. ..	67	80	73
35-	.. ..	66	60	63
45-	.. ..	68	52	62
55-	.. ..	62	55	59
65-	.. ..	62	58	60
75 and up	.. ..	61	66	64

In this table the mortality of the year under review is compared at each age with the most exacting pre-war standard available—the rates for 1912-14, after which war and influenza brought about a temporary increase. The fall since 1912-14 is seen to be slightly increased on standardization, from 34 to 36 per cent. for persons of both sexes, a trifling decrease (35 to 34 per cent.) for females being more than counterbalanced by an increase from 34 to 37 per cent. for males. Reduction is greatest and to almost the same extent for both sexes in childhood and least in youth.

The minimum decline for males occurs at the age-group 15-20 and for females at 20-25, the latter having fallen below the pre-war standard for the first time in 1930. At these two age-groups, the decline for males is greatly in excess of that for females.

After 25 the rate of decline accelerates rapidly especially for females, whose rates have fallen more than those of males at all ages from 35 to 75. For each of the age-groups over 35 the rate for the sexes jointly is now less than two-thirds what it was immediately before the war.

The localisation with regard to age and sex of the recent improvement in tuberculosis mortality is also indicated in another



way by expressing the deaths from all forms of tuberculosis in terms of deaths from all causes at the same ages in the two triennial periods 1912-14 and 1929-31. When these proportionate mortalities, shown below as per mille ratios, for the later period are expressed in terms of the corresponding ratios for the earlier period taken as 100, a deficiency below 100 indicates that the fall in tuberculosis mortality has been more rapid than the fall in mortality from all causes, whilst an excess over 100 indicates that the former has not kept pace with the latter.

	Deaths from Tuberculosis per 1,000 deaths from all Causes.				Proportionate Mortality in 1929-31 in terms of that in 1912-14 taken as 100.		Proportionate Mortality for Females per cent. of that for Males.	
	1912-14.		1929-31.		Male.	Female.	1912-14.	1929-31.
	Male.	Female.	Male.	Female.				
0- ..	54	54	37	39	69	72	100	105
5- ..	176	180	116	130	66	72	102	112
10- ..	230	335	150	228	65	68	146	152
15- ..	323	460	302	476	93	104	142	158
20- ..	408	435	370	477	91	110	107	129
25- ..	372	349	342	347	92	99	94	101
35- ..	273	215	243	179	89	83	79	74
45- ..	161	104	143	76	89	73	65	53
55- ..	74	43	57	30	77	70	58	53
65- ..	22	15	15	10	68	67	68	67
75 & up	4	3	3	2	75	67	75	67

At ages under 15 for both sexes, and for males over 55 and females over 45, it is evident that the proportionate mortality has fallen by 23 to 35 per cent. of its value in 1912-14, and for males aged 15-55 by about 10 per cent. For females aged 20-25, however, tuberculosis mortality has not declined with the general death-rate (the actual tuberculosis rates per million being 1,381 in 1912-14 and 1,399 in 1929-31), and 48 per cent. of all deaths at these ages were due to tuberculosis in the later period. For females aged 15-20 the tuberculosis rate has fallen, but not so rapidly as the general death-rate, and at 25-35 it has fallen only slightly more rapidly.

These differences in the extent of improvement are also reflected in the ratio of female to male proportionate mortality, which has increased at ages under 30 and diminished at ages over 30, female proportionate mortality being now 58 per cent. in excess of that for males at ages 15-20, and 29 per cent. in excess at 20-25.

The failure of young adult females to participate in the improvement in tuberculosis mortality of the last twenty years is a matter which merits careful attention. The same phenomenon is evident in other countries, especially in Norway,\* and may result from a postponement of tuberculization from childhood until early adult life for an increasing fraction of the community as the outcome of improved hygiene and protection of children from sources of infection.† For the female population of urban

\* Acta Medica Scandinavica. LXXX. 1933. p. 323.

† Medical Research Council Special Report No. 164, 1932.

areas such as postponement of the inevitable contest with tuberculous infection, so that it coincides with the period of greatest biological stress, may not be wholly advantageous and may continue to check the fall of tuberculous mortality at that period of life. Comparing 1931 with 1911, the mortality rate for females aged 15-25 per 100,000 from respiratory tuberculosis increased in London from 92 to 114, but declined in the rural districts as a whole from 112 to 96, showing little change in the towns. The diminishing importance of selective migration of the more healthy young women into London may partly account for this, the London rate being now intermediate between the small and large towns as at all ages taken together (Table XXXVIII).

The 29,658 deaths from respiratory tuberculosis form 83 per cent. of the total allocated to tuberculosis, and 6.0 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 XXXVIII.

Table XXXVIII.—Tuberculosis of Respiratory System: Mortality per 100,000 Living at different Ages in different Areas, 1931.

	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.
<b>MALES.</b>												
All Ages—	87	98	114	71	93	85	66	70	91	111	76	56
Crude ..	78	85	98	64	84	77	60	62	85	99	69	52
Standardized	78	85	98	64	84	77	60	62	85	99	69	52
0- ..	11	10	14	3	17	11	10	—	9	15	10	8
5- ..	7	4	5	5	10	5	3	8	8	9	7	4
15- ..	84	89	96	61	92	79	68	71	113	105	77	59
25- ..	111	119	130	97	113	110	94	97	132	128	105	84
35- ..	135	133	153	129	139	142	107	117	140	174	121	92
45- ..	155	179	219	119	171	157	107	109	135	214	120	86
55- ..	127	162	198	98	134	122	87	95	120	165	102	73
65- ..	77	106	134	62	80	73	52	60	69	96	66	46
75 & up	29	47	60	26	30	16	44	4	30	29	25	20
<b>FEMALES.</b>												
All Ages—	62	60	68	51	65	64	57	56	83	73	58	52
Crude ..	60	56	63	48	63	61	57	56	85	70	56	53
Standardized	60	56	63	48	63	61	57	56	85	70	56	53
0- ..	9	11	17	5	10	8	9	9	8	11	8	6
5- ..	11	10	13	9	16	8	7	9	13	15	11	7
15- ..	110	100	114	77	123	104	103	101	177	130	104	96
25- ..	103	93	96	90	101	106	112	112	152	116	89	98
35- ..	76	69	80	63	79	86	61	65	102	89	69	70
45- ..	56	55	66	51	56	65	48	43	59	70	48	44
55- ..	46	49	53	40	44	51	56	36	46	53	41	38
65- ..	36	40	48	40	33	33	27	39	42	38	37	30
75 & up	22	26	31	20	22	21	35	15	15	19	22	21

The relation of phthisis mortality to urbanization is manifested by the decline of the standardized rate for males from 99 per



100,000 in the county boroughs outside Greater London and 98 in London itself, to 52 in the rural districts. For females the effect of urbanization is not so great, the rates being 70 in the county boroughs, 63 in London, and 53 in the rural districts. The ratio of county borough to rural mortality is greater for males than females at all ages, but the contrast is most evident at ages after 35. It was noticed in the Review for 1930 that in recent years London phthisis mortality has exceeded that of the county boroughs at all age groups under 45, but has been more favourable at later ages. In 1931 London has the advantage at ages 0-25 and 35-45 for males and at 5-55 for females.

The new regional distribution indicates that for each sex the standardized rate is highest in Wales and also above average in the North. For males this rate is lowest in the East, and for females in the South East excluding Greater London. In England the regional range is only 60 to 85 for males and 56 to 63 for females. The Welsh rates show no excess over the general average for children under 5, nor for males aged 45-75 nor females aged 55-65 and over 75. The favourable position of the South East is manifest for all the sex and age groups except 65-75 for females.

In considering the rates shown in Table XXXVIII, the possibility of over diagnosis of phthisis in childhood and its under diagnosis in late life in areas where facilities for accurate certification are less than in London must be borne in mind, as also the selective migration of tuberculous persons between town and country.

Amongst counties of over 100,000 population the lowest rates were those of Derbyshire, 417; Oxfordshire, 477; Hertfordshire, 485; Buckinghamshire, 496; Norfolk, 507 and Suffolk East 510.

The highest county borough rates were those for Bootle, 1,464; Middlesbrough, 1,361; South Shields, 1,261; and Merthyr Tydfil, 1,231. The Rochdale rate, 483, was lowest.

The death rates from tuberculosis of the intestines, peritoneum and bones, and from the disseminated form, continue to fall rapidly as indicated by Table 7, but mortality from tuberculosis of the nervous system has not declined since 1928, as shown by the standardized rates in Table 8.

The progressive fall, since 1861-65 and 1876-80 respectively, in the death rates at ages under 5 from tuberculosis of the nervous system and of the intestines and peritoneum has been detailed in Table XXIV and the paragraphs relating to it. The distribution of mortality from these causes in 1926-30 and in 1931 according to sex, age and part of the country, is set out in Table XXXIX. At ages over 35 the numbers of deaths in a year are small, and no useful comparison can be made at the later age groups between the tabulated rates, save for the country as a whole.

Table XXXIX.—Tuberculosis of Nervous System, Intestines and Peritoneum: Mortality per million living by sex and age in different regions, 1926-30 and 1931.

	England and Wales.		London Administrative County.		North.		Rest of England.		Wales.	
	1926-30	1931	1926-30	1931	1926-30	1931	1926-30	1931	1926-30	1931
<b>Tuberculosis of the Nervous System.</b>										
MALES.										
All Ages—										
Crude . . . .	74	70	65	57	88	86	66	61	77	83
Standardized . .	91	91	79	74	107	110	83	79	90	103
0 . . . .	471	464	386	281	556	579	444	417	377	492
5 . . . .	112	104	102	120	136	127	94	81	136	131
15 . . . .	42	32	45	59	47	59	35	44	58	67
25 . . . .	18	21	14	15	19	21	19	22	20	20
35 . . . .	11	13	9	15	12	11	11	14	15	18
45 . . . .	8	7	5	8	9	8	8	6	9	—
55 . . . .	3	5	2	—	4	7	2	3	9	17
65 . . . .	1	1	—	—	2	—	0	2	4	—
75 & up . . . .	—	—	—	—	—	—	—	—	—	—
FEMALES.										
All Ages—										
Crude . . . .	62	60	55	47	75	72	53	54	70	68
Standardized . .	83	84	77	71	98	99	74	76	82	82
0 . . . .	411	392	375	300	485	478	384	371	293	246
5 . . . .	111	112	113	119	133	138	92	85	128	159
15 . . . .	47	55	38	39	55	58	39	57	82	52
25 . . . .	13	19	10	18	14	19	11	16	23	44
35 . . . .	7	8	5	6	7	7	7	12	6	11
45 . . . .	5	7	1	3	6	7	5	6	9	6
55 . . . .	3	3	1	—	5	2	3	3	2	17
65 . . . .	2	4	3	—	3	3	2	6	—	—
75 & up . . . .	2	—	—	—	5	—	1	—	—	—
<b>Tuberculosis of the Intestines and Peritoneum.</b>										
MALES.										
All Ages—										
Crude . . . .	34	27	18	13	48	36	29	23	32	32
Standardized . .	39	31	19	14	55	42	33	27	35	36
0 . . . .	161	110	49	33	247	138	134	107	100	106
5 . . . .	32	29	16	9	45	46	27	19	30	41
15 . . . .	32	29	17	21	41	38	27	23	45	40
25 . . . .	19	14	12	3	20	19	19	11	21	26
35 . . . .	16	16	12	11	20	25	14	13	18	6
45 . . . .	15	15	14	20	18	12	13	14	22	26
55 . . . .	14	16	13	5	18	20	11	16	13	8
65 . . . .	15	9	22	—	18	14	13	10	7	—
75 & up . . . .	5	6	7	31	8	1	5	—	—	—
FEMALES.										
All Ages—										
Crude . . . .	33	28	14	14	46	39	28	23	38	38
Standardized . .	38	32	15	14	54	44	32	26	41	41
0 . . . .	113	85	24	13	172	134	92	73	108	39
5 . . . .	34	23	9	9	53	32	28	19	27	29
15 . . . .	35	35	23	21	50	51	27	24	42	71
25 . . . .	30	30	13	15	35	33	28	27	46	69
35 . . . .	24	19	11	18	31	21	22	18	31	11
45 . . . .	17	16	9	7	22	20	16	14	16	19
55 . . . .	17	17	9	9	17	33	18	9	23	17
65 . . . .	12	15	8	15	12	14	13	14	14	30
75 & up . . . .	5	4	12	17	4	—	4	3	16	—



For the nervous system, in England and Wales the rates were higher in 1931 than in 1926-30 at ages 15-45 for each sex, but a slight improvement had occurred at ages under 5. The standardized rates declined in London, the improvement being confined, however, to ages under 5. In the North there was a slight increase in the standardized rate for each sex, and in Wales for males.

For the intestines and peritoneum in the country as a whole the standardized rates in 1931 were lower than in 1926-30 by 21 per cent. for males and 16 per cent. for females, the improvement being mainly at ages under 15. In the English divisions the standardized rates declined by 17 to 26 per cent., except the London rate for females which fell by only 7 per cent. In Wales there was little change.

The rapidity with which non-respiratory tuberculosis mortality in general continues to fall may be gathered from the differences between the rates in Table 8. During the eleven years covered by this table the standardized rate for each sex has fallen without interruption, from 289 to 196 for males, or by 32 per cent., and from 254 to 170 for females, or by 33 per cent., the percentage decline for the respiratory form of the disease in the same period being 17 for males and 21 for females. During these eleven years the proportion of non-respiratory to total (standardized) mortality has fallen from 24 to 21 per cent.

44 (1 and 2). *Vaccinia and other sequelæ of Vaccination.*—Eight deaths were assigned to the heading of Vaccinia in 1931, and of these one male aged 4 years, and four females aged 4 months, 10 months, 4 years and 8 years respectively were returned after post-mortem examination as being associated with encephalitis against 11 in 1929 and 3 in 1930. The remaining deaths were of a male aged 2 months with meningitis, a male aged 5 months with otitis media and septicæmia and a female aged 4 weeks with colitis and marasmus. Five deaths were classed to other sequelæ of vaccination, two being erysipelas and three general septic infections from vaccination wounds, and five deaths in which inquiry showed that vaccination, though recent, had not been an important factor in the fatal issue, were classed to their various causes.

45-53. *Cancer.*—The deaths ascribed to cancer during 1931 number 59,346—27,777 of males and 31,569 of females. For both sexes these numbers are the highest yet recorded.

Of these deaths 50,763 were referred to carcinoma, 2,653 to sarcoma, and 5,930 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 of the total cancer deaths than heretofore. Indeed, its ratio of 45 per 1,000 total cancer deaths in 1931 is the lowest yet returned.

The standardized death-rate for males in 1931 amounts to 1,031 per million, and that for females to 974. During the last

three years the increase in female mortality has been arrested, the rate having shown a small decrease in each of the years 1929, 1930 and 1931. 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, reaching 57 per million in 1931. The crude death-rate is seen from Table 7 to be in constant excess each year for females. But this is because of their greater age, and when this is allowed for by standardization, Table 8 shows the rate for males as constantly in excess during 1924-31.

For sarcoma the crude rate was 71 per million in 1928 and 1929, 68 in 1930, and 66 in 1931. When standardized there is a considerable male excess, the rate being 62.7 for males and 42.7 for females in 1931.

Attention was directed in the 1925 "Text" volume (p. 101) to the absence of seasonal variations in the mortality from cancer, and this was further exemplified by the experience in the March quarters of 1929 and 1930, when, notwithstanding the widely different meteorological conditions, the deaths were almost equal (14,480 in 1929 and 14,409 in 1930). Table LXV shows how slight was the variation in mean monthly mortality during 1926-30.

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

Table XL.—England and Wales: Mortality from Cancer (All Sites), 1931.

	Mortality per Million.			Sex Ratio.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
All Ages	1,450	1,516	1,484	977	1,022	1,000
Crude ..	1,031	974	996	1,035	978	1,000
Standardized ..	40	34	37	1,081	919	1,000
0— ..	17	11	14	1,214	786	1,000
5— ..	47	36	41	1,147	878	1,000
15— ..	118	151	135	874	1,119	1,000
25— ..	422	740	594	710	1,246	1,000
35— ..	1,630	2,129	1,896	860	1,123	1,000
45— ..	4,620	4,111	4,352	1,062	945	1,000
55— ..	10,165	7,528	8,704	1,168	865	1,000
65— ..	13,617	11,836	12,528	1,087	945	1,000
75— ..						

From 25 years, at which age the mortality becomes significant, 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 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

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



25 and 65 than at all ages jointly (see "Text" Volume of the Review for 1929, page 57). The percentage share of the breast and uterus in the total cancer mortality of females, is:—

All ages	0-	25-	35-	45-	55-	65-	75-	85-
	34.0	2.4	38.9	52.3	47.6	36.0	26.7	22.8 26.5

The rates per million males and females from cancer of sites other than the breast and genital organs in 1931 compare as follows:—

	All Ages	0-	25-	35-	45-	55-	65-	75-	85-	
	(Standardized)									
Males	..	957	32	108	406	1,569	4,377	9,315	12,086	12,006
Females	..	580	22	78	297	959	2,407	5,196	8,575	9,532
Male excess		65	46	38	37	64	82	79	41	26
	(per cent.)									

Thus mortality from sites other than those associated with reproduction was higher for males than for females at every age, the excess reaching a maximum of 82 per cent. at age 55-65 years.

Table XLI.—Sarcoma, Carcinoma and Cancer Undefined, 1928-31: Death Rates per 100,000 Living and Percentage of those for All Forms of Cancer.

Age.	Deaths per 100,000 Living.			Percentage of all forms of Cancer.		
	Sarcoma.	Carcinoma.	Cancer undefined.	Sarcoma.	Carcinoma.	Cancer undefined.
MALES.						
All ages—Standardized	6.7	85.1	11.4	—	—	—
0- .. ..	2.6	0.6	0.1	77	19	4
25- .. ..	3.7	7.1	1.0	32	60	8
35- .. ..	7.0	32.3	3.7	16	75	9
45- .. ..	13.1	132.3	16.2	8	82	10
55- .. ..	21.8	390.2	51.1	5	84	11
65- .. ..	29.8	857.5	118.9	3	85	12
75 and up ..	31.9	1,183.1	171.2	2	86	12
FEMALES.						
All ages—Standardized	4.5	83.7	10.8	—	—	—
0- .. ..	1.9	0.7	0.1	70	25	5
25- .. ..	2.5	12.1	1.1	16	77	7
35- .. ..	4.3	64.0	7.1	6	85	9
45- .. ..	8.6	180.6	21.0	4	86	10
55- .. ..	14.1	352.4	45.5	3	86	11
65- .. ..	19.5	671.5	91.2	3	85	12
75 and up ..	24.5	1,043.2	147.2	2	86	12

The mortality attributed to sarcoma is lowest at ages 10-15, the mean rates per 100,000 in 1928-31 in the first five quinquennial age groups being 3.1, 1.5, 1.3, 2.5, 2.8. Thereafter they are seen from Table XLI, where the sexes are separated, to increase continually throughout life, the male rate being constantly in excess to the extent of about 50 per cent. At ages under 25 deaths assigned to sarcoma at present comprise 77 per cent. of all cancer deaths in males and 69 per cent. in females, these rates falling rapidly to 2 per cent. in advanced age. The proportion of cancer deaths undefined increases with age from 5 to 12 per cent.

Table XLII shows the trend of cancer mortality by sex and age since 1901-10.

Table XLII.—Cancer: Mortality in 1901-10, 1911-20, 1921-30, and 1931 in England and Wales.

Age.	Mortality per 100,000 Living.				Mortality per cent. of the rate in 1901-10.		
	1901-10.	1911-20.	1921-30.	1931.	1911-20.	1921-30.	1931.
MALES.							
All ages—Crude ..	77	99	129	145	129	168	188
Standardized.	78	90	100	103	115	128	132
0- .. ..	2	2	2	2	100	100	100
15- .. ..	4	4	5	5	100	125	125
25- .. ..	11	11	12	12	100	109	109
35- .. ..	41	42	42	42	102	102	102
45- .. ..	155	168	163	163	108	105	105
55- .. ..	390	444	472	462	114	121	118
65- .. ..	668	800	955	1,016	120	143	152
75 and up ..	787	973	1,276	1,362	124	162	173
FEMALES.							
All ages—Crude ..	103	117	139	152	114	135	148
Standardized.	94	96	99	97	102	105	103
0- .. ..	2	2	2	2	100	100	100
15- .. ..	3	3	4	4	100	133	133
25- .. ..	17	16	16	15	94	94	88
35- .. ..	85	79	76	74	93	89	87
45- .. ..	232	227	214	213	98	92	92
55- .. ..	441	438	424	411	99	96	93
65- .. ..	666	711	774	753	107	116	113
75 and up ..	790	919	1,131	1,184	116	143	150



The crude death-rate at all ages for males in 1931 is 88 per cent. and the female rate 48 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 rates which take into account the rapidly increasing proportion of elderly persons in the population and so correct the exaggerated impression conveyed when crude rates are compared.

The trend of the sex death-rates at the several age-groups are widely different. The rates for each sex at ages over 75 have increased progressively since 1901-10, more rapidly for males than females. At 65-75 there has also been a progressive increase for males, but for females this has been recently arrested. At 45-65 there is evidence of an arrest in the increase of the male rates, commencing earlier at 45-55 than at 55-65, whilst the female rates at each age group from 25 to 65 have declined since 1901-10, the extent of this fall amounting to 13 per cent. at ages 35-45, 8 per cent. at 45-55 and 7 per cent. at 55-65.

Cancer mortality is analysed according to sex, age, region and class of area in Table XLIII. The standardized rate for each sex declines, as noticed in previous years, from a maximum in London to a minimum in the rural districts, the range according to urbanization, as thus measured, being thrice as great for males, 123 to 90, as for females, 102 to 91. For males the progressive increase with urbanization is noticed at each age group from 25 upwards, and is most pronounced at 45-55 when the London rate is 66 per cent. in excess of that for the rural districts. For females London has a lower rate than the county boroughs at 45-65.

These relations suggest that cancer may be more often certified in the towns because hospital and other facilities for its recognition are there greatest, but earlier treatment, particularly of cancer of the breast, in so far as it reduces mortality, tends to affect the rates in the opposite sense.

Apart from Greater London, the North gives the highest standardized mortality in each sex, whilst the South West shows the lowest rate for males and the South East for females. The regional dispersion thus indicated is greater for males than females and appears to be most important at ages 55-65, when the Northern rate is 41 per cent. in excess of that in the Eastern counties. Wales as a whole gives average rates, but when divided into Wales I and II, the standardized rate is higher in the latter, being for persons 91 per 100,000 in Wales I, and 107 in Wales II.

*Cancer by Site.*—The parts of the body affected by fatal cancer in 1931 are shown in Table XLIV in greater detail than that provided by the international classification, six out of its nine

Table XLIII.—Cancer (All Sites) : Mortality per 100,000 Living in different Areas and at different Ages, 1931.

	England and Wales.	Greater London.	London Adm. 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.												
Ages—												
Crude..	145	150	169	154	142	139	153	156	131	146	142	143
Standardized..	103	113	123	95	107	101	92	91	96	110	99	90
0- ..	4	5	5	2	4	5	4	4	2	3	3	6
5- ..	2	3	4	1	2	2	1	1	1	1	2	2
15- ..	5	4	5	4	5	5	8	6	4	5	4	5
25- ..	12	15	16	9	11	13	8	7	12	15	10	6
35- ..	42	47	54	37	46	36	33	35	44	47	37	37
45- ..	163	182	207	126	168	167	153	146	163	183	154	125
55- ..	462	505	559	400	499	445	355	398	453	498	452	381
65- ..	1,016	1,094	1,177	962	1,050	1,033	948	895	914	1,082	998	902
75 & up ..	1,362	1,485	1,539	1,490	1,325	1,283	1,345	1,279	1,130	1,343	1,290	1,374
FEMALES.												
Ages—												
Crude..	152	152	159	167	146	144	170	179	136	148	155	153
Standardized..	97	99	102	91	100	97	95	93	96	100	97	91
0- ..	3	4	3	3	3	4	—	1	5	3	3	3
5- ..	1	1	1	1	1	1	1	2	0	1	1	1
15- ..	4	3	3	4	4	4	2	4	6	4	3	4
25- ..	15	16	17	14	15	17	10	12	17	16	14	13
35- ..	74	76	84	60	77	79	79	67	71	82	68	67
45- ..	213	211	217	207	217	213	213	211	215	229	203	202
55- ..	411	406	399	379	431	411	391	411	418	425	426	374
65- ..	753	772	804	704	803	700	753	710	765	754	760	724
75 & up ..	1,184	1,288	1,316	1,168	1,161	1,211	1,187	1,091	985	1,134	1,214	1,110

headings (Nos. 45-53) being sub-divided. Fuller details with regard to cancer of the uterus and of the skin than those shown in the Table are also available. The cancer mortality distribution is shown by sex, age and site as well as by the nature of the growth to which the deaths were attributed, under the headings carcinoma, sarcoma and "cancer" not otherwise defined. Continuing the 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."



Table XLIV.—England and Wales—Sites and Forms of Fatal Cancer, 1931.

	Carcinoma.	Sarcoma.	"Cancer." Not otherwise defined.	All Ages.	DEATHS OF MALES.																
					0-	5-	15-	25-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85 & up		
All Sites .. .. .	—	—	—	27,777	61	55	161	362	396	665	1,408	2,343	3,581	4,604	5,280	4,471	2,758	1,200	432		
Carcinoma .. .. .	23,457	—	—	23,457	8	7	53	224	303	532	1,160	1,964	3,046	3,944	4,530	3,877	2,400	1,033	376		
Sarcoma .. .. .	—	1,481	—	1,481	50	47	103	107	64	89	136	162	184	172	156	116	59	29	7		
"Cancer." Not otherwise defined .. .. .	—	—	2,839	2,839	3	1	5	31	29	44	112	217	351	488	594	478	299	138	49		
45 { Lip .. .. .	273	—	13	286	—	—	—	—	—	3	7	10	27	34	46	61	52	33	13		
Tongue .. .. .	979	1	81	1,061	—	—	—	1	6	8	39	76	165	226	235	172	88	34	11		
Mouth .. .. .	285	1	18	304	—	—	—	1	—	2	10	27	54	64	69	43	26	5	3		
Tonsil .. .. .	221	16	23	260	—	1	4	1	—	4	11	18	43	53	54	37	18	11	5		
Jaw .. .. .	296	91	50	437	3	7	4	4	8	11	15	44	56	59	99	60	43	18	6		
Pharynx .. .. .	314	8	34	356	—	—	4	6	1	3	18	32	52	72	80	51	27	9	1		
Others .. .. .	233	5	9	247	1	—	1	—	3	4	5	11	38	42	61	42	25	12	2		
Total .. .. .	2,601	122	228	2,951	4	8	13	13	18	35	105	218	435	550	644	466	279	122	41		
46 { Oesophagus .. .. .	1,565	3	174	1,742	—	—	1	6	6	10	52	146	286	380	370	248	165	51	21		
Stomach .. .. .	5,678	6	581	6,265	1	—	4	69	107	176	390	584	813	1,086	1,228	989	544	191	83		
Small intestine .. .. .	79	5	15	99	—	—	3	2	1	4	8	11	16	9	15	19	6	3	2		
Cæcum .. .. .	237	—	25	262	—	—	—	7	5	9	11	16	32	50	41	50	24	14	3		
Hepatic flexure .. .. .	41	—	2	43	—	—	—	—	1	—	—	3	3	9	9	11	3	3	1		
Splenic flexure .. .. .	78	—	6	84	—	—	1	1	—	1	5	9	8	17	15	15	7	3	2		
Sigmoid flexure .. .. .	632	—	48	680	—	—	1	6	13	19	25	48	65	108	138	130	80	37	10		
Large intestine (colon) .. .. .	1,907	2	160	2,069	—	—	4	21	26	40	74	148	216	304	413	361	294	122	46		
Rectum (excluding anus) .. .. .	2,666	1	262	2,929	—	—	14	38	35	60	119	227	337	485	588	529	321	137	38		
Liver .. .. .	1,034	20	217	1,271	3	1	4	11	15	33	51	92	154	208	246	247	121	70	15		
Gall bladder .. .. .	215	—	36	251	—	—	—	—	—	2	12	14	32	44	51	46	33	12	5		
Pancreas .. .. .	705	3	75	783	—	—	2	4	11	21	48	75	116	133	163	113	62	28	7		
Others .. .. .	373	71	121	565	7	2	7	13	11	11	28	43	69	78	90	105	57	33	11		
Total .. .. .	15,210	111	1,722	17,043	11	4	41	178	231	386	823	1,416	2,147	2,911	3,367	2,863	1,717	704	244		

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Table XLIV—cont.

	Carcinoma.	Sarcoma.	"Cancer." Not otherwise defined.	All Ages.	DEATHS OF MALES—cont.																
					0-	5-	15-	25-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85 & up		
47 { Larynx .. .. .	800	6	68	874	—	—	2	2	7	11	41	95	150	162	158	133	84	22	7		
Lung .. .. .	1,055	138	165	1,358	2	1	14	39	53	89	171	207	255	201	164	96	44	13	9		
Others .. .. .	135	77	88	300	—	3	4	8	5	17	30	36	54	44	39	37	17	5	1		
Total .. .. .	1,990	221	321	2,532	2	4	20	49	65	117	242	338	459	407	361	266	145	40	17		
50 Breast .. .. .	58	1	2	61	—	—	—	1	1	2	2	2	10	9	5	13	12	4	—		
51 { Kidney, suprarenal .. .. .	141	160	45	346	22	5	6	12	9	16	26	34	50	53	53	36	15	5	4		
Bladder, urethra, ureter .. .. .	831	4	99	934	—	—	—	4	9	14	43	74	109	160	180	163	115	55	8		
Prostate .. .. .	1,278	13	241	1,532	1	1	—	1	2	5	21	44	101	224	355	357	247	131	42		
Testis .. .. .	62	58	9	129	3	1	11	27	12	13	15	16	8	4	6	5	4	—	—		
Penis .. .. .	163	2	8	173	—	—	—	1	3	3	12	12	18	27	27	29	25	10	6		
Scrotum .. .. .	69	—	4	73	—	—	—	—	—	—	8	7	12	17	12	6	9	1	1		
Total .. .. .	2,544	237	406	3,187	26	7	17	45	35	51	125	187	298	485	633	596	415	206	61		
52 Skin .. .. .	612	55	16	683	—	2	1	9	9	8	20	49	54	63	89	130	106	83	60		
53 { Brain, meninges .. .. .	12	79	12	103	—	10	4	14	6	11	11	15	14	9	6	1	1	1	—		
Thyroid .. .. .	68	1	2	71	—	—	—	—	—	2	8	3	14	13	16	8	6	1	—		
Bones (jaw excepted) .. .. .	54	306	25	385	4	12	52	21	8	19	36	48	35	44	44	34	17	10	1		
Others and unspecified .. .. .	308	348	105	761	14	8	13	32	23	34	36	67	115	113	115	94	60	29	8		
Total .. .. .	442	734	144	1,320	18	30	69	67	37	66	91	133	178	179	181	137	84	41	9		

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Table XLIV—cont.

	Carcinoma.	Sarcoma.	"Cancer." Not otherwise defined.	All Ages.	DEATHS OF FEMALES.																
					0-	5-	15-	25-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85- & up		
All Sites .. .. .	—	—	—	31,569	50	36	125	506	763	1,426	2,320	3,285	3,839	4,248	4,603	4,367	3,316	1,793	892		
Carcinoma .. .. .	27,306	—	—	27,306	3	—	51	396	663	1,242	2,009	2,856	3,324	3,692	4,018	3,831	2,885	1,543	793		
Sarcoma .. .. .	—	1,172	—	1,172	41	36	65	77	48	61	103	139	147	119	124	98	63	35	16		
"Cancer." Not otherwise defined .. .. .	—	—	3,091	3,091	6	—	9	33	52	123	208	290	368	437	461	438	368	215	83		
45 { Lip .. .. .	15	—	2	17	—	—	—	—	—	—	—	1	—	3	1	6	3	2	1		
45 { Tongue .. .. .	106	1	13	120	—	—	—	—	4	3	4	10	14	20	21	22	12	10	—		
45 { Mouth .. .. .	28	1	1	30	—	—	—	—	2	1	2	4	7	2	4	2	3	1	2		
45 { Tonsil .. .. .	26	6	3	35	—	1	—	1	1	1	—	—	4	5	5	9	3	4	1		
45 { Jaw .. .. .	93	56	15	164	1	1	5	—	3	7	3	13	19	32	33	18	18	7	4		
45 { Pharynx .. .. .	86	4	8	98	—	1	2	2	3	2	8	15	16	12	18	9	6	2	2		
45 { Others .. .. .	40	6	4	50	—	—	1	—	1	2	3	4	6	8	4	7	8	6	—		
Total .. .. .	394	74	46	514	1	3	8	3	14	16	20	47	66	82	86	73	53	32	10		
46 { Esophagus .. .. .	545	1	76	622	—	—	—	—	6	25	48	71	87	91	91	76	61	43	23		
46 { Stomach .. .. .	4,758	2	443	5,203	—	—	5	61	83	140	238	429	549	774	884	920	660	324	136		
46 { Small intestine .. .. .	85	4	10	99	1	—	1	3	2	4	8	8	6	10	19	12	17	7	1		
46 { Cæcum .. .. .	283	—	35	318	—	—	—	3	6	10	14	21	34	38	37	58	55	29	13		
46 { Hepatic flexure .. .. .	68	—	2	70	—	—	—	1	—	1	3	7	7	7	13	11	15	4	1		
46 { Splenic flexure .. .. .	104	—	9	113	—	—	—	—	5	4	3	8	11	12	22	21	19	3	5		
46 { Sigmoid flexure .. .. .	647	—	51	698	—	—	1	12	15	31	35	57	85	85	105	106	102	48	16		
46 { Large intestine (colon) .. .. .	2,437	1	202	2,640	—	—	7	21	32	61	121	184	254	346	408	450	411	228	117		
46 { Rectum (excluding anus) .. .. .	1,818	2	152	1,972	—	—	7	23	27	64	106	151	210	282	333	338	228	138	65		
46 { Liver .. .. .	1,196	10	247	1,453	1	1	3	10	18	28	63	89	134	186	268	277	211	107	57		
46 { Gall bladder .. .. .	502	2	76	580	—	—	1	1	3	14	17	29	62	93	114	111	76	39	20		
46 { Pancreas .. .. .	662	3	60	725	—	—	—	3	7	21	32	72	95	103	138	116	77	46	15		
46 { Others .. .. .	624	68	183	875	1	3	2	21	10	24	37	63	84	118	123	133	136	88	32		
Total .. .. .	13,729	93	1,546	15,368	3	4	27	159	214	427	725	1,189	1,618	2,145	2,555	2,629	2,068	1,104	501		

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Table XLIV—cont.

	Carcinoma.	Sarcoma.	"Cancer." Not otherwise defined.	All Ages.	DEATHS OF FEMALES—cont.																
					0-	5-	15-	25-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85- & up		
47 { Larynx .. .. .	218	—	29	247	—	—	2	3	13	13	26	38	28	38	35	28	15	6	2		
47 { Lung .. .. .	389	54	79	522	3	1	8	17	9	33	45	55	79	84	87	54	35	7	5		
47 { Others .. .. .	64	36	39	139	1	3	1	7	5	6	11	17	20	24	21	9	4	8	2		
Total .. .. .	671	90	147	908	4	4	11	27	27	52	82	110	127	146	143	91	54	21	9		
48 Uterus .. .. .	3,925	61	355	4,341	1	—	4	93	193	340	500	659	657	539	552	407	246	104	46		
49 { Ovary .. .. .	1,043	48	191	1,282	3	1	20	46	59	96	159	210	186	163	147	104	62	19	7		
49 { Vulva .. .. .	352	7	26	385	—	—	1	3	5	8	22	22	43	44	63	73	54	29	18		
49 { Others .. .. .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Total .. .. .	1,395	55	217	1,667	3	1	21	49	64	104	181	232	229	207	210	177	116	48	25		
50 Breast .. .. .	5,797	29	555	6,381	—	—	—	104	198	413	664	845	875	844	755	678	498	317	190		
52 Skin .. .. .	416	59	5	480	1	—	2	11	7	8	12	30	36	28	50	64	90	73	68		
53 { Brain, meninges .. .. .	10	59	7	76	7	3	4	6	2	7	9	13	9	9	3	2	2	—	—		
53 { Thyroid .. .. .	162	7	5	174	—	—	—	5	5	9	11	14	23	21	34	27	17	6	2		
53 { Kidney, suprarenal .. .. .	109	120	42	271	20	7	5	7	7	10	19	27	32	38	39	26	20	9	5		
53 { Bladder, urethra, ureter .. .. .	344	2	44	390	—	—	—	4	3	7	15	17	34	56	60	73	67	38	16		
53 { Bones (jaw excepted) .. .. .	57	259	17	333	4	10	22	15	10	15	39	27	36	45	32	37	24	12	5		
53 { Others and unspecified .. .. .	297	264	105	666	6	4	21	23	19	18	43	75	97	88	84	83	61	29	15		
Total .. .. .	979	711	220	1,910	37	24	52	60	46	66	136	173	231	257	252	248	191	94	43		

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The facts as to cancer mortality distribution by sex, age and site contained in Table XLIV are summed up for each site in Table XLV, which compares total mortality in 1931 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 1931 over the previous year are, for males—lung 10·8 per million, bladder 2·3, prostate 1·3, pharynx 1·2, oesophagus 0·8, and for females—breast 5·7 and lung 2·4.

The sites showing at least 25 per cent. increase in mortality from 1911-20 to 1931 are, for males, the lung (302 per cent.), prostate (112), pancreas (72), gall bladder (52), kidney and suprarenals (52), breast (44), intestine (40), rodent ulcer (34) and larynx (32), and for females the lung (133), ovary and Fallopian tubes (75), pancreas (65), gall bladder (46), kidney and suprarenals (32), larynx (32) and intestine (25). Those showing a decline are the lip, tongue, jaw, liver, mesentery and skin in both sexes, and the uterus and bones in females and penis in males.

The rate for cancer of the lung in males was twice as great in 1921-30 as in 1911-20, and was again doubled by 1931. This increase has been almost equally rapid at all ages over 35 in males, and the magnitude of the increase in both sexes suggests improved means of diagnosis as the cause.

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 50 per cent. since 1921 (Table 8). The increase in the standardized mortality from cancer since 1911-20 is 74 per cent. at ages under 65, 117 at 65-75 and 146 at 75 and upwards. The greater increase in advanced age is probably due to many deaths, both from malignant and non-malignant prostatic disease, having been formerly returned as old age.

Excepting rodent ulcer, the larynx, and the male breast, all sites in both sexes showing high rates of increase, are included in the group of inaccessible sites in the Report for 1926 (p. 66). It is therefore probable that these increases may, in some measure, be due to improvement in diagnosis, and in the case of intestinal and gastric cancer, to the continued decrease of certification from secondary cancer of the liver and mesentery and peritoneum which have 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 1931 has been 18 per cent. for males but remains almost stationary for females.

Table XLV.—Cancer Mortality.—Rates per Million Population (Standardized) for the more important Sites for each Sex 1901-10, 1911-20, 1921-30, 1927, 1928, 1929, 1930 and 1931.

	Males.		Females.		Males.		Females.		Males.		Females.		Males.		Females.						
	All Sites.	Lip.	Tongue.	Mouth and Tonsil.	Jaw.	Pharynx.	Oesophagus.	Stomach.	Liver.	Gall-bladder.	Mesentery and Peritoneum.	Intestine.	Rectum.	Ovary and Fallopian Tube.	Uterus.	Breast.	Rodent Ulcer.	Penis.	Scrotum.	Other Skin.	
1901-10	784	942	12·8	0·8	43·1	4·4	?	?	22·6	6·9	8·2	15·8	63·5	72·3	79·8	55·9	—	19·2	—	?	?
1911-20	897	959	12·6	0·7	50·8	4·3	23·5	3·0	25·1	7·2	6·0	12·0	95·3	109·2	93·6	59·3	—	24·3	—	17·6	10·9
1921-30	1,004	986	11·5	0·7	46·1	3·8	28·3	3·6	20·8	6·4	12·6	3·0	64·2	18·1	221·1	155·5	61·0	60·9	8·8	16·6	
1927	1,018	984	11·9	1·0	46·6	4·3	29·5	3·4	21·1	6·0	12·7	2·8	60·7	18·0	229·0	157·0	55·8	52·1	8·3	17·6	
1928	1,032	1,000	12·3	0·7	45·5	4·2	30·5	3·5	19·6	5·5	12·6	2·9	64·3	18·7	227·4	161·5	51·8	52·6	9·5	16·9	
1929	1,031	999	10·4	0·6	41·8	4·1	27·6	3·5	19·2	6·5	13·8	2·8	62·3	18·3	237·2	164·6	52·3	50·6	9·4	17·6	
1930	1,031	987	11·3	0·7	40·6	3·5	29·3	3·8	16·7	5·3	11·8	3·2	61·8	18·6	233·7	162·8	47·7	45·4	9·5	17·1	
1931	1,031	974	10·7	0·5	38·0	3·6	29·3	3·5	16·5	5·2	13·0	3·2	62·6	18·7	230·5	155·5	46·8	42·7	9·1	16·9	
1901-10	?	?	51·2	14·6	167·2	133·0	?	?	?	?	8·2	15·8	63·5	72·3	79·8	55·9	—	19·2	—	?	?
1911-20	10·8	3·0	60·6	16·5	186·4	139·0	87·1	98·0	6·0	11·6	6·0	12·0	95·3	109·2	93·6	59·3	—	24·3	—	17·6	10·9
1921-30	12·6	3·0	64·2	18·1	221·1	155·5	61·0	60·9	8·8	16·6	12·6	3·0	64·2	18·1	221·1	155·5	61·0	60·9	8·8	16·6	
1927	12·6	2·8	60·7	18·0	229·0	157·0	55·8	52·1	8·3	17·6	12·7	2·8	60·7	18·0	229·0	157·0	55·8	52·1	8·3	17·6	
1928	12·6	2·9	64·3	18·7	227·4	161·5	51·8	52·6	9·5	16·9	12·6	2·9	64·3	18·7	227·4	161·5	51·8	52·6	9·5	16·9	
1929	13·8	2·8	62·3	18·3	237·2	164·6	52·3	50·6	9·4	17·6	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	11·8	3·2	61·8	18·6	233·7	162·8	47·7	45·4	9·5	17·1	
1931	13·0	3·2	62·6	18·7	230·5	155·5	46·8	42·7	9·1	16·9	13·0	3·2	62·6	18·7	230·5	155·5	46·8	42·7	9·1	16·9	
1901-10	8·2	15·8	63·5	72·3	79·8	55·9	—	19·2	—	?	8·2	15·8	63·5	72·3	79·8	55·9	—	19·2	—	?	?
1911-20	6·4	8·1	125·4	129·9	105·8	59·8	—	36·0	—	17·4	6·4	8·1	125·4	129·9	105·8	59·8	—	36·0	—	17·4	10·9
1921-30	4·8	7·3	132·0	131·8	105·7	60·3	—	38·9	—	15·1	4·8	7·3	132·0	131·8	105·7	60·3	—	38·9	—	15·1	10·2
1927	5·8	7·3	132·5	138·5	105·7	58·0	—	39·2	—	15·9	5·8	7·3	132·5	138·5	105·7	58·0	—	39·2	—	15·9	10·3
1928	4·4	7·2	134·3	138·6	108·0	58·3	—	40·8	—	15·0	4·4	7·2	134·3	138·6	108·0	58·3	—	40·8	—	15·0	9·9
1929	4·9	6·6	136·9	138·4	110·6	59·9	—	42·3	—	10·7	4·9	6·6	136·9	138·4	110·6	59·9	—	42·3	—	10·7	10·2
1930	5·3	6·6	135·7	136·3	108·8	59·5	—	42·6	—	9·0	5·3	6·6	135·7	136·3	108·8	59·5	—	42·6	—	9·0	9·9
1931	1·5	158·4	?	?	?	—	—	—	—	?	1·5	158·4	?	?	?	—	—	—	—	?	?
1911-20	1·6	170·8	6·7	4·3	6·6	—	2·4	—	17·6	10·9	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	—	18·8	10·2	1·8	189·1	8·4	4·9	6·4	—	2·7	—	18·8	10·2	
1927	1·6	193·5	6·5	5·2	6·4	—	3·0	—	17·6	10·3	1·6	193·5	6·5	5·2	6·4	—	3·0	—	17·6	10·3	
1928	1·9	196·2	9·0	5·7	6·1	—	3·1	—	18·2	9·9	1·9	196·2	9·0	5·7	6·1	—	3·1	—	18·2	9·9	
1929	1·8	195·7	9·5	5·0	5·7	—	2·7	—	18·2	10·7	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	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	—	2·7	—	17·4	9·2	2·3	200·2	9·0	4·7	6·5	—	2·7	—	17·4	9·2	
1901-10	?	?	10·2	7·0	14·5	11·8	8·4	7·6	?	?	?	?	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	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	31·3	7·1	25·2	9·6	26·3	19·5	11·7	8·9	30·5	11·4	
1927	31·7	6·9	26·8	9·7	30·3	20·4	12·2	9·6	30·5	11·6	31·7	6·9	26·8	9·7	30·3	20·4	12·2	9·6	30·5	11·6	
1928	31·8	7·6	32·0	10·4	28·8	21·0	12·5	9·0	32·0	11·9	31·8	7·6	32·0	10·4	28·8	21·0	12·5	9·0	32·0	11·9	
1929	31·4	7·6	33·4	11·9	30·3	20·0	13·2	9·6	32·3	12·3	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	31·6	8·5	40·2	13·9	29·4	23·8	13·0	8·7	31·8	11·5	
1931	31·6	7·9	51·0	16·3	28·7	21·6	13·8	9·5	34·1	11·0	31·6	7·9	51·0	16·3	28·7	21·6	13·8	9·5	34·1	11·0	
1901-10	11·8	—	?	—	?	?	8·1	4·5	—	—	11·8	—	?	—	?	?	8·1	4·5	—	—	
1911-20	26·5	—	4·9	—	15·7	12·0	9·2	4·6	—	—	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	—	—	47·7	—	5·8	—	17·6	13·5	12·6	5·8	—	—	
1927	47·8	—	7·1	—	18·1	11·7	12·9	6·0	—	—	47·8	—	7·1	—	18·1	11·7	12·9	6·0	—	—	
1928	53·8	—	6·3	—	18·6	14·6	13·3	5·4	—	—	53·8	—	6·3	—	18·6	14·6	13·3	5·4	—	—	
1929	56·4	—	5·2	—	17·6	14·6	12·1	5·6	—	—	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	—	—	54·9	—	6·7	—	17·3	12·0	13·1	5·3	—	—	
1931	56·2	—	5·9	—	16·4	11·7	11·4	4·6	—	—	56·2	—	5·9	—	16·4	11·7	11·4	4·6	—	—	

Mortality from cancer of the breast—the most frequent site in females and accounting for about one-fifth of their total cancer mortality—shows a progressive increase, which, although less rapid in proportion to the mortality itself, is really of greater importance than the higher rates of increase for sites of lesser frequency. In 1911-20 the mortality was 8 per cent. higher than in the previous decennium and for 1921-30 the rate of increase rose further to 11 per cent., whilst the rate in 1931 is again 6 per cent. in excess of the rate during 1921-30. The increase in standardized mortality since 1901-10 has been 25 per cent. at







Table XLVI.—England and Wales, 1931: Deaths attributed to Tumours not returned as Malignant—*continued.*

Part affected.	All Ages.		0-		15-		35-		45-		55-		65-		75 & up.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
<i>Tumours not classed with other disease of organ affected—continued.</i>																
Lung .. . Non-malignant ..	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—
.. . Nature unstated ..	49	17	—	—	2	1	5	3	15	2	13	5	10	4	4	2
Parotid .. . Non-malignant ..	2	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—
.. . Nature unstated ..	2	4	—	—	—	—	—	—	—	—	—	—	2	—	—	1
Œsophagus .. . Non-malignant ..	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
.. . Nature unstated ..	2	2	—	—	—	—	—	—	—	—	—	2	1	—	1	—
Stomach.. . Polypus ..	2	1	—	—	—	—	—	1	—	—	2	—	—	—	—	—
.. . Other benign ..	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
.. . Nature unstated ..	3	6	—	—	1	—	—	—	—	—	—	1	—	4	2	1
Intestine .. . Polypus ..	2	4	—	—	—	—	—	2	1	1	1	—	—	1	—	—
.. . Other benign ..	3	7	1	1	—	1	—	2	—	2	1	1	—	—	1	—
.. . Nature unstated ..	14	17	—	—	1	—	2	—	—	—	3	3	5	3	3	11
Rectum .. . Papilloma ..	1	2	—	—	—	—	—	—	—	1	—	—	—	—	1	1
.. . Polypus ..	1	2	—	—	1	—	1	—	—	—	—	—	—	—	1	—
.. . Other benign ..	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
.. . Nature unstated ..	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Liver .. . Non-malignant ..	1	4	—	1	—	1	1	—	—	—	—	1	—	1	—	—
.. . Nature unstated ..	6	1	1	—	—	—	1	—	—	—	—	1	—	2	—	1
Gall bladder .. . Non-malignant ..	1	2	—	—	—	—	—	—	1	1	—	1	—	—	—	—
.. . Nature unstated ..	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Pancreas .. . Cyst..	4	6	—	—	—	1	—	—	1	1	—	3	2	1	1	—
.. . Nature unstated ..	2	2	—	—	—	—	—	—	1	—	1	—	—	2	—	—
Kidney .. . Cyst..	—	3	—	—	—	—	—	—	—	—	—	2	—	—	—	1
.. . Other benign ..	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
.. . Nature unstated ..	6	9	1	—	—	1	—	1	1	—	1	2	2	3	1	2
Bladder .. . Papilloma ..	126	46	—	—	4	—	5	3	13	7	30	7	47	12	27	17
.. . Polypus ..	3	3	—	1	—	—	—	—	—	1	—	—	—	—	2	2
.. . Other benign ..	4	1	—	—	—	—	—	—	1	1	—	—	—	—	1	—
.. . Nature unstated ..	10	4	—	—	—	—	—	—	—	—	2	—	4	—	3	4
Spleen .. . Non-malignant ..	2	1	—	—	—	—	—	—	1	—	—	1	—	—	—	—
.. . Nature unstated ..	2	1	—	—	—	—	—	—	—	—	2	—	—	—	—	1
Prostate .. . Non-malignant ..	2	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—
.. . Nature unstated ..	3	—	—	—	—	—	—	—	—	—	—	—	—	—	3	—
Breast .. . Adenoma Cyst-adenoma.	—	4	—	—	—	—	—	—	—	1	—	1	—	—	—	2
.. . Other benign ..	—	2	—	—	—	—	—	—	1	—	1	—	—	—	—	—
Jaw .. . Non-malignant ..	3	2	—	—	1	—	—	—	—	1	—	1	—	—	1	—
Spine .. . Myeloid sarcoma ..	1	2	—	—	—	—	—	—	1	1	—	—	—	1	—	—
.. . Other benign ..	1	5	—	—	1	2	—	—	—	1	—	2	—	—	—	—
.. . Nature unstated ..	5	6	—	—	1	1	—	—	2	1	2	—	—	2	—	2
Neck .. . Cyst ..	6	2	1	—	2	1	—	—	—	—	1	1	—	—	—	2
.. . Other benign ..	—	3	—	1	—	—	—	—	—	—	—	1	—	—	—	—
Thorax .. . Non-malignant ..	1	1	—	—	—	—	—	—	1	—	—	1	—	—	—	—
.. . Nature unstated ..	7	2	—	—	1	—	2	—	1	1	2	1	1	—	—	—
Abdomen .. . Non-malignant ..	4	3	1	1	1	1	1	—	—	1	—	—	1	—	—	—
.. . Nature unstated ..	10	29	1	—	—	—	—	3	—	3	4	2	4	9	1	12
Other sites.. . Non-malignant ..	32	32	8	2	8	8	3	4	3	4	3	2	5	5	2	7
.. . Nature unstated ..	6	9	—	—	—	1	1	1	—	1	2	1	2	3	1	2
Site not stated.. . Non-malignant ..	3	2	1	1	—	—	—	—	—	—	1	1	—	—	—	—
.. . Nature unstated ..	3	1	—	—	—	—	—	—	1	—	1	1	—	—	—	1
Total (54 and 55) ..	1131	1712	98	77	191	215	144	278	225	432	228	283	165	234	80	193
Total, all tumours ..	1368	1712	98	77	191	215	144	278	229	432	257	283	261	234	188	193
.. . benign tumours ..	721	1099	51	49	86	127	66	194	88	299	110	158	169	135	151	137
.. . nature unstated ..	647	613	47	28	105	88	78	84	141	133	147	125	92	99	37	56

grouped in 137, 139 and 141 (2), there are two new groups, "54, Non-malignant tumours" and "55, Tumours of undetermined nature," each sub-divided into (a) Female genital organs and (b) Other sites.

"Adenoma" of the prostate remains classed to diseases of the prostate, No. 137, rather than to these headings because the deaths so returned seem to be of the nature of prostatic hypertrophy. The rapid increase in this case suggests change in medical nomenclature.

Adenoma of the thyroid, which has shown a similar increase, is no longer included in this table, but is classed to No. 66 (a), Simple goitre, a new group in the International List.

Other sites of rapid increase of late years include the pituitary gland and lung. Deaths ascribed to pituitary tumour have grown from 7 in 1913 to 46 in 1930 and 41 in 1931. Deaths from tumour of the lung increased from numbers ranging between 11 and 21 during 1912-19 to 80 in 1930 and 69 in 1931. Like lung cancer, which also increased rapidly at the same time (Table XLV), 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 5,810, 2,259 of males and 3,551 of females, corresponding to standardized death-rates of 88 for males and 111 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 rate for males reached its lowest value of 81 per million in 1925, increased again to 95 by 1929, and has fallen to 88 in 1931. The female rate fell from 104 in 1915 to 82 in 1920, averaged 93 in 1921-23, and 91 in 1924-26, then rose to 101 in 1927 and again to 111 in 1929, which was also the rate in 1931.

Since 1922 the increase has been confined to the higher ages, as shown by the comparison in Table XLVII of death-rates at various ages in subsequent years with those for 1920-22 (before the introduction of insulin in 1923).

Since the introduction of insulin in 1923 the mortality of males has fallen at all ages under 55 to an extent ranging from 28 per cent. at 45-55 to 50 at 25-35, or 38 per cent. altogether, and that of females by only 2 per cent. at 45-55, but by 23 per cent. at all ages under 55. But the effect of this large reduction, which was shown in the Review for 1928 to have been closely associated with the use of insulin, applying as it does only to the period subsequent to the introduction of the new remedy in 1923, has been masked in the total death-rate by large increases of mortality for each sex at all ages over 55. In 1931 the rate for females of 75 and over was almost double that of the three years before the introduction



Table XLVII.—England and Wales: 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.								
<b>Death-Rates per Million Living.</b>											
<b>Males:—</b>											
1920-22 ..	93.7	47.9	477.5	14	42	60	69	133	309	661	772
1923 ..	89.7	38.0	523.6	11	33	48	60	99	322	744	876
1924 ..	86.0	34.5	517.8	9	29	38	52	110	322	696	944
1925 ..	81.4	32.0	496.2	11	22	43	43	93	286	698	928
1926 ..	86.1	32.8	533.8	13	28	36	48	90	325	741	950
1927 ..	87.8	32.2	554.4	11	31	41	40	84	330	767	1,025
1928 ..	91.1	30.2	602.5	13	25	33	38	91	331	898	1,081
1929 ..	95.1	35.1	598.9	12	25	36	62	105	327	859	1,161
1930 ..	92.7	31.1	609.6	10	24	38	41	98	338	861	1,192
1931 ..	87.9	29.5	578.7	12	22	30	38	96	314	817	1,160
<b>Females:—</b>											
1920-22 ..	90.1	43.1	483.9	16	35	48	62	124	355	656	632
1923 ..	94.1	40.9	540.3	11	30	44	59	142	389	735	733
1924 ..	88.5	32.2	561.2	11	28	32	47	99	390	774	797
1925 ..	93.8	34.6	591.3	11	30	32	53	111	394	858	811
1926 ..	90.6	31.7	585.6	9	25	35	51	99	400	831	807
1927 ..	101.1	32.8	674.7	11	25	32	45	113	464	883	1,092
1928 ..	101.3	34.0	666.9	11	26	33	41	127	419	966	1,027
1929 ..	110.6	34.7	747.8	11	22	31	52	132	479	1,033	1,236
1930 ..	107.6	30.9	752.3	11	18	27	44	123	464	1,081	1,220
1931 ..	110.8	33.3	761.5	11	26	31	45	121	474	1,090	1,225

Mortality of Later Years per cent. of that in 1920–22.

<b>Males:—</b>											
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	138
1928 ..	97	63	126	93	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	121	86	52	50	55	72	102	124	150
<b>Females:—</b>											
1923 ..	104	95	112	69	86	92	95	115	110	112	116
1924 ..	98	75	116	69	80	67	76	80	110	118	126
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	134	166	194

of insulin, so, as there were large increases also at 55–65 and 65–75, the reduction in rate at 0–55 is converted into an increase of 23 per cent. in total mortality. In males the senile increase has been much smaller, and as the decrease at ages under 55 is greater than for females the resultant mortality at all ages is 6 per cent. below that for 1920–22.

As pointed out in previous Reviews (1925, 1928) the course of senile diabetes mortality has been closely related to the food supply, falling during the period of restriction in 1916–18, and rising after that ended. It seems probable that the mortality ascribed to diabetes at the higher ages is mainly of dietetic origin and that, so long as the conditions leading to its increase

continue, the effect of insulin in reducing the mortality of early and middle life will continue to be masked in the total death-rate by the senile increase. It is also probable that more complete certification of diabetes as a causal factor in contributing to a fatal result has been the outcome of a more frequent search for the disease in elderly people, together with the introduction of the new form of death certificate.

71 (a). **Pernicious Anæmia.**—As a new and effective treatment for this disease came into use in this country towards the close of 1927 the record of its recent mortality is of special interest at the present time.

The death-rates per million living at each age group are shown in Table XLVIII for each sex from 1922 onwards.

Table XLVIII.—England and Wales, 1922–31.—Mortality of Males and Females from Pernicious Anæmia. Death-rates per million living in each Year.

	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
<b>Males.</b>										
All Ages (Standardized).	50	44	45	46	47	45	30	32	35	34
0- ..	5	4	4	4	4	5	5	4	5	5
5- ..	3	4	2	4	1	2	3	4	2	3
15- ..	8	7	9	7	8	5	7	4	4	4
25- ..	16	14	8	16	15	13	12	9	9	9
35- ..	51	43	32	33	42	32	17	20	25	17
45- ..	116	101	103	102	111	83	53	50	59	48
55- ..	240	212	226	224	219	236	126	141	174	163
65- ..	345	301	355	345	345	370	269	298	295	310
75 and up.	177	188	174	236	199	230	187	269	245	301
<b>Females.</b>										
All Ages (Standardized).	59	54	57	57	61	56	39	39	42	43
0- ..	8	5	6	5	7	6	6	4	5	2
5- ..	4	3	3	3	1	4	2	3	1	3
15- ..	10	12	12	15	16	10	10	8	6	7
25- ..	33	31	27	28	26	26	16	15	20	17
35- ..	69	64	70	62	74	60	38	36	39	39
45- ..	129	130	129	126	135	132	72	76	80	85
55- ..	259	227	254	244	264	242	178	170	182	199
65- ..	347	286	317	362	394	353	281	301	300	326
75 and up.	226	191	216	200	202	224	187	224	284	233

First distinguished in tabulation from other forms of anæmia in 1920 these deaths yielded standardized rates in 1921 of 46 per million males and 60 per million females (Table 8), which by 1926 had not changed appreciably. These rates fell immediately upon



the introduction of the new liver treatment to 45 and 30 in 1927 and 1928 for males and to 56 and 39 for females, since when the rates have increased slightly to 34 and 43 per million in 1931. This fall has been greatest in middle life, the male rates at 35-55 having declined by 57 per cent. from 1926 to 1931, and the female rate at 35-45 by 47 per cent. At 65-75, the age of highest mortality, the fall has been smaller, and at ages over 75 there has been an increase. In each year 1921-31 mortality has been higher for females.

**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 XLIX.

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 XLIX 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 cannot be taken as measuring it absolutely. During the past half century the mortality rates corresponding to Table XLIX and its predecessors have fluctuated in close correspondence with the records of consumption of alcohol. (See Diagram II in Report for 1929.)

These deaths make up a total of 629 as against 81 classed to heading 75 as directly due to alcohol. The former number is 18 less than that for 1930. From 384 in 1926, the last complete year in which the old form of death certificate was in use, the deaths from other causes specified as of alcoholic origin increased to 644 in 1927, and to 755 in 1928, but afterwards declined to 553 in 1930 and to 548 in 1931.

A progressive decline since 1920, temporarily interrupted in 1925 and 1929, has occurred in the number of deaths attributed solely to alcoholism without mention of other causes, the mean standardized rates for 1927-31 being 2.8 for males and 1.3 for females, compared with 4.3 and 1.7 per million for the preceding 5 years. The male standardized rate in 1931, 1.6 per million, is the lowest ever recorded. The new form of medical certificate, introduced in 1927, has not resulted in any apparent increase in the assignment of deaths to this cause.

**82. Cerebral Hæmorrhage, Apoplexy, etc.**—The revised form of the International List (1929) now in use 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

Table XLIX.—England and Wales, 1931: Deaths from or connected with Alcoholism.

	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 .. .. .	40	41	—	—	5	1	8	5	8	13	12	8	6	11	1	3
Deaths attributed to other causes in conjunction with alcoholism—																
11. Influenza .. .. .	6	1	—	—	—	—	2	1	3	—	—	—	1	—	—	—
15. Erysipelas .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
23. Tuberculosis of the respiratory system .. .. .	4	2	—	—	—	—	1	—	2	1	—	1	1	—	—	—
34. Syphilis .. .. .	2	—	—	—	1	—	—	—	—	—	—	—	1	—	—	—
36. Septicæmia .. .. .	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
45-53. Cancer .. .. .	7	2	—	—	—	—	—	—	2	—	1	1	4	1	—	—
55. Cerebral tumour .. .. .	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
56. Acute rheumatism .. .. .	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
58. Gout .. .. .	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
59. Diabetes .. .. .	5	3	—	—	—	—	—	—	2	—	2	3	1	—	—	—
69 (2) Diabetes insipidus .. .. .	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
80. Tabes dorsalis .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
81 (1) Progressive bulbar paralysis .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
81 (4) Spastic paresis .. .. .	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
82. Cerebral hæmorrhage, apoplexy, etc. .. .. .	6	3	—	—	—	—	1	—	1	1	3	1	1	1	—	—
83. General paralysis of the insane .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
85. Epilepsy .. .. .	4	—	—	—	1	—	—	—	2	—	1	—	—	—	—	—
87b. Neuritis, neuralgia .. .. .	9	8	—	—	—	—	2	1	2	1	3	1	1	2	1	3
87d. Disseminated sclerosis .. .. .	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
88. Cataract extraction .. .. .	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
92. Valvular disease of heart .. .. .	5	6	—	—	—	—	2	1	—	2	2	1	1	2	—	—
93a. Acute myocarditis .. .. .	2	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—
93b (1) Fatty heart .. .. .	8	8	—	—	—	—	3	2	2	2	3	2	—	2	—	—
93b (2) Cardiovascular degeneration .. .. .	2	2	—	—	—	—	—	—	—	—	2	—	—	2	—	—
93b (3) Other or unspecified myocardial disease .. .. .	21	16	—	—	—	—	1	1	6	5	6	4	7	6	1	—
93c. Myocarditis not distinguished as acute or chronic .. .. .	6	2	—	—	—	—	1	1	2	—	3	1	—	—	—	—
94. Diseases of the coronary arteries .. .. .	1	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
97. Arterio-sclerosis .. .. .	10	1	—	—	—	—	—	—	—	—	4	—	5	1	1	—
99. Aortitis .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
100 (1) Varix .. .. .	2	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
106. Bronchitis .. .. .	9	1	—	—	1	—	—	—	1	—	4	—	3	—	—	1
107. Broncho-pneumonia .. .. .	8	3	—	—	—	—	1	1	3	2	2	—	1	—	—	1
108. Lobar pneumonia .. .. .	17	5	—	—	1	—	2	2	8	1	3	—	3	2	—	—
110 (2) Pleurisy .. .. .	2	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—
111 (1) Hypostatic pneumonia .. .. .	1	1	—	—	—	—	—	—	1	—	—	—	—	—	—	1
114a. Fibroid lung .. .. .	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—
115 (1) Pyorrhæa .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
117a. Ulcer of the stomach .. .. .	3	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—
118 (1) Inflammation of the stomach .. .. .	9	2	—	—	—	—	2	—	4	—	2	1	1	—	—	1
118 (2) Acute dilatation of the stomach .. .. .	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—
119-120 Diarrhoea and enteritis .. .. .	1	1	—	—	—	—	1	—	—	1	—	—	—	—	—	—
122a : 1 Strangulated hernia .. .. .	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
124a. Cirrhosis of the liver .. .. .	162	99	—	—	1	1	19	5	44	26	55	37	35	20	8	10
128. Acute pancreatitis .. .. .	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
130-131 Nephritis .. .. .	15	7	—	—	1	—	—	—	3	2	5	1	2	3	4	—
136a. Stricture of the urethra .. .. .	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
137. Enlarged prostate gland .. .. .	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
152 (1) Cellulitis of left shoulder .. .. .	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—
163-171 Suicide .. .. .	5	—	1	—	—	—	—	—	—	2	—	—	—	—	—	—
183. Accidental drowning .. .. .	3	—	—	—	—	—	1	—	—	—	1	—	—	—	—	1
186 pt. Injury by fall .. .. .	10	1	—	—	—	—	—	—	—	4	—	4	—	1	—	1
186 pt. Injury by crushing (vehicles, railway, etc.) .. .. .	2	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—
Other violence .. .. .	4	1	—	—	—	1	—	—	—	2	—	—	2	—	—	—
Total .. .. .	407	222	1	—	13	4	56	22	111	58	128	67	81	50	17	21

classification. The last two groups are of diminishing importance, their contributions forming 5.3 and 1.4 per cent. respectively of the total in 1931, compared with 7.9 and 3.1 per cent. respectively in 1921. The number of deaths assigned to these headings showed a substantial decrease in 1927 and 1928 when compared with the immediately preceding years, but has not continued to decline since, deaths in 1931 numbering 26,297 (males 11,593,



females 14,704) compared with 25,615 in 1928 (Table 6). The standardized rates in 1931, calculated on the revised populations, are 435 per million for males and 421 for females, those for the preceding year being 405 and 415. The true frequency of these causes of death since 1926 is somewhat masked by increased precision in certification due in some measure to the introduction in 1927 of the new form of medical certificate which has encouraged statement of the disease causing the hæmorrhage and so 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 91*b*:1 in the previous 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 912 for males and 987 for females. When standardized, however, to eliminate the effect of the increasing age of the population, the male rate of 655 and the female rate of 586 per million are not greatly different from the rates of 1921, namely, 640 for males and 592 for females.

For the age-group 45-55, the earliest at which the mortality from this cause becomes significant, the female death-rate has exceeded that for males in every year from 1911 onwards; at the age-groups 55-65, 65-75 and 75 years and upwards, the male rate has with few exceptions been in excess of the female, this being the case in 1931.

**90-95. Heart Diseases.**—The number of deaths allocated to this cause, 101,353, 47,960 of males and 53,393 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 2,503 for males and 2,564 for females, which are the highest recorded for each sex during the present century. When standardized, the revised rates are considerably reduced to 1,840 for males and 1,593 for females, but still remain in this form the highest for males and second highest for females during 1921-31 (Table 8).

As it has been pointed out in previous Reviews that 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 L has been repeated to show how the rates quoted above for 1931 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 from the standardized death-rate (Table 8) that portion of it for which myocardial disease at ages over 65 (other than fatty heart) was responsible in each year 1921-31.

The Fourth Revision of the International List brings together into a single group, No. 93, diseases of the myocardium, with sub-groups (a) acute, (b) chronic, and (c) not specified. Excluding the special subdivision of fatty heart (93*b* (1)) and acute myocarditis (93*a*), the old group (90 (7)) at ages over 65 is now replaced by the three groups 93*b* (2), 93*b* (3) and 93 (c).

Table L.—Deaths in Standard Million from Heart Diseases at all ages, and from senile myocarditis at ages over 65 in each year 1921-31; also the mortality in each year from Heart Diseases other than senile myocarditis.

	Males.			Females.		
	90-95. All Heart Diseases.	93 <i>b</i> (2), <i>b</i> (3), <i>c</i> Myocardial disease (not acute or fatty). Aged 65 and upwards.	Col. 1 less col. 2.	90-95. All Heart Diseases.	93 <i>b</i> (2), <i>b</i> (3), <i>c</i> Myocardial disease (not acute or fatty). Aged 65 and upwards.	Col. 4 less col. 5.
	(1)	(2)	(3)	(4)	(5)	(6)
1921 ..	1,203	154	1,049	1,107	145	962
1922 ..	1,301	198	1,103	1,218	187	1,031
1923 ..	1,210	210	1,000	1,129	195	934
1924 ..	1,267	254	1,013	1,181	229	952
1925 ..	1,322	313	1,009	1,220	278	942
1926 ..	1,298	337	961	1,188	304	884
1927 ..	1,412	399	1,013	1,303	360	943
1928 ..	1,474	456	1,018	1,349	413	936
1929 ..	1,835	693	1,142	1,658	619	1,039
1930 ..	1,706	648	1,058	1,486	562	924
1931 ..	1,840	744	1,096	1,593	646	947
Figures 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	483	104	144	446	98

The crude death-rate from heart disease has increased since 1921 by 79 per cent., but the standardized rate has increased by 53 per cent. for males and 44 per cent. for females. When further



allowance is made for the disturbing influences mentioned above, the increase is seen to have been only 4 per cent. for males and there has been a decrease of 2 per cent. for females.

Table L also shows how rapid has been the increase for each sex of mortality ascribed to senile myocarditis, the rates for 1931 being nearly five times those of 1921. Its contribution to total heart disease mortality has increased from 13 per cent. in 1921 to 41 per cent. in 1931. Another change in the medical terminology of heart disease is reflected in the continuous 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 34 for males and 42 for females in 1931. This increase is doubtless mainly at the expense of "heart disease (undefined)" for which the standardized rates have fallen since 1922 from 271 to 105 for males and from 250 to 91 for females.

More important is the rise in standardized mortality assigned to diseases of the coronary arteries and angina pectoris, No. 94, since 1920 from 32 to 167 for males and from 13 to 59 for females. 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, amounting to 65 per cent. for males and 69 per cent. for females represents a real change in the frequency with which death is attributed to coronary disease. This has occurred at every age-group, the percentage increase in standardized mortality at ages under 45 being 48 for males and 81 for females, at 45-65 60 for males and 61 for females, and at 65 and upwards 72 for males and 75 for females.

97. **Arterio-sclerosis.**—The deaths from this cause were first distinguished in 1911, when they numbered 3,675. In each successive year the number increased, reaching a total of 25,753 in 1928. In 1929 the number fell to 20,987, and in 1930 to 18,925, but increased again to 20,729 in 1931.

A change of such magnitude in medical terminology has naturally vitiated the comparability of certain other headings in the list of causes of death. The heavy incidence of the disease in persons of advanced age and the decline during the same period of the deaths assigned to senile decay, suggests that many of the deaths which formerly would have been certified as due to the latter cause are now returned as due to arterio-sclerosis. The tendency to more precise certification has further increased the mortality by transference to this heading of deaths from cerebral hæmorrhage. Comparability has, however, further been disturbed, but in the contrary direction, by a change in classification, introduced in 1929. For some years past the term "cardiovascular degeneration" and the joint statement of arterio-sclerosis and cardiac or myocardial degeneration have appeared with increasing frequency on medical certificates. The former is assigned by

international usage to heart disease, but the separate statement of the two diseases has, by the operation of the selective rules for joint causes, been assigned to the disease entered as primary on the medical certificate. In consequence of the increased frequency of the use of the compounded term (1,060 deaths in 1925 and 2,229 deaths in 1930) it was decided to assign both forms of statement to heart disease.

This change of practice accounts in great measure for the recent decline of the deaths assigned to this heading. In 1928 the standardized rates reached 581 for males and 352 for females, falling again to 398 and 261 per million in 1930 (Table 8). A slight increase occurred in 1931, to 411 and 275 per million respectively (revised rates).

104-114. **Diseases of the Respiratory System.**—The total number of deaths allocated to these diseases was 64,007, or 12,090 more than in 1930. The revised standardized death-rates, 1,703 per million for males and 1,244 for females, are lower than in any year except 1928 and 1930 (Table 8), in both of which years circumstances favourable to a low respiratory mortality—mild winter and low incidence of epidemic influenza—prevailed. The March quarter is responsible for the bulk of the variation in mortality which occurs from year to year, and the fractions of the whole year's deaths from respiratory diseases which occurred in this quarter of each year since 1921 (Table LI) are closely related both to the meteorological conditions and to the prevalence of influenza in those quarters.

In 1931 the March quarter was characterised by a low mean temperature, exceeded in each of the eleven years except 1929, and by an influenza mortality only exceeded in 1922, 1924, 1927

Table LI.—Respiratory Diseases, in each year 1921 to 1931 : Mortality, sex-ratio and percentage of Deaths in the March quarter.

Year.	Standardized Rates per Million.		Ratio of (a) per 1,000 (b).	Percentage of Deaths occurring in First Quarter.
	(a) Males.	(b) Females.		
1921	2,176	1,609	1,353	37
1922	2,510	1,896	1,324	42
1923	1,973	1,451	1,360	32
1924	2,217	1,682	1,318	47
1925	2,108	1,572	1,341	35
1926	1,851	1,349	1,372	37
1927	2,060	1,513	1,361	50
1928	1,649	1,151	1,432	38
1929	2,258	1,670	1,352	56
1930	1,438	958	1,501	38
1931	1,703	1,244	1,369	47



and 1929. The five years with high influenza mortality in the first quarter (Table XXXI) are also the five years giving the highest percentage of respiratory mortality in this quarter, ranging from 56 in 1929, the year with the coldest March quarter, to 42 in 1922, which ranked fourth as regards coldness. Of the six years when influenza was not prevalent, 1923, with the mildest March quarter, had the lowest percentage of respiratory mortality in this quarter, 32, and the three years next in order of mildness, 1921, 1926 and 1928, gave low percentages of 37, 37 and 38. Further reference to the effect of influenza epidemics is made in the section on "Seasonal Distribution of Mortality." (Page 100.)

Comparing 1931 with the preceding year, the increase in the number of deaths from respiratory diseases occurring in the March quarter amounted to 53 per cent. against only 5 per cent. in the remaining three quarters.

Attention has also been drawn in previous years to the influence of meteorological conditions on the sex mortality from respiratory diseases, unfavourable conditions usually causing a proportionally higher increase in the female death-rate with a consequent decrease in the male-female mortality ratio and *vice versa* when favourable conditions prevail.

The experience of 1931 further confirms this tendency of the male-female sex ratio to move in the opposite direction to mortality.

The following statement shows the variations in the percentage ratio of male to female mortality at different periods of life:—

0-	5-	15-	25-	35-	45-	55-	65-	75 and upwards.
128	102	151	151	201	248	177	131	108

At 5-15 and in old age the male excess is slight; at 15-35 it amounts to 51 per cent., and reaches a maximum of 148 per cent. at 45-55, then declining. For the seven years 1919-25 the maximum excess occurred at ages 35-45, but since then has shifted to 45-55.

130-132. Acute and Chronic Nephritis.—The group under the heading "chronic nephritis" in the revised (1929) International List differs from the group previously used by excluding deaths from nephritis undefined as acute or chronic, which were previously classed as chronic if they occurred at ages over 10. The deaths at these ages in the new unqualified group (132) form 98 per cent. of those at all ages, and for purposes of continuity Nos. 131 and 132 combined may be regarded as equivalent to the group of chronic nephritis hitherto used. The transfer of amyloid disease to group No. 69 of the general diseases has no quantitative importance since only 3 deaths were attributed to this cause in 1931. The combined standardized death-rates for Nos. 131 and 132 (Table 8) in 1931 were 297 per million for males and 232 for females, showing no appreciable change since 1929 when the rates

had risen to 297 and 237 respectively. These rates remain for each sex well below the maximum attained in 1913-15 (392 for males and 287 for females). The crude rates (Table 7) are subject to considerable reduction on standardization, as this form of mortality chiefly affects the increasing proportion of elderly persons in our population.

Mortality attributed to acute nephritis continued to decline in 1931, the standardized rate having fallen since 1921 from 42 to 27 for males and from 33 to 23 for females.

140-150. The Puerperal State.—The number of deaths assigned to pregnancy or childbirth was 2,601 (Tables 6, 21 and LVII), corresponding to a rate of 4.11 per 1,000 (live) births. Inclusion of the 911 deaths in Table LVIII, which were classified to non-puerperal headings, raises the proportion to 5.55 deaths stated to have been caused by, or associated with, pregnancy and childbirth for every 1,000 (live) births.

In addition to these deaths 79 others from criminal abortion were assigned to various forms of violence, *e.g.*, suicide, murder, etc., in accordance with the verdicts recorded by the coroners'

Table LII.—England and Wales. Mortality of Women in or associated with Childbirth per Thousand Children born alive, 1891-1931.

Year.	Classification in use from 1911 onwards.				Classification in use before 1911.				Total Maternal Mortality.
	Puerperal Sepsis.	Other Puerperal causes.	Total Puerperal Mortality.	* Non-puerperal causes.	Puerperal Sepsis.	Other Puerperal causes.	Total Puerperal Mortality.	† Non-puerperal causes.	
1891-95 ..	—	—	—	—	2.60	2.89	5.49	—	—
1896-1900 ..	—	—	—	—	2.12	2.57	4.69	—	—
1901-05 ..	—	—	—	—	1.95	2.32	4.27	1.29	5.56
1906-10 ..	—	—	—	—	1.56	2.18	3.74	1.26	5.00
1911-15 ..	1.42	2.61	4.03	0.99	1.50	2.31	3.81	1.21	5.02
1916-20 ..	1.51	2.61	4.12	1.68	1.59	2.29	3.88	1.92	5.80
1921-25 ..	1.40	2.50	3.90	1.14	1.48	2.21	3.69	1.35	5.04
1926-30 ..	1.73	2.54	4.27	1.24	1.78	2.23	4.01	1.50	5.51
1911 ..	1.43	2.44	3.87	1.04	1.52	2.15	3.67	1.24	4.91
1912 ..	1.39	2.59	3.98	0.97	1.47	2.31	3.78	1.17	4.95
1913 ..	1.26	2.70	3.96	0.91	1.34	2.37	3.71	1.16	4.87
1914 ..	1.55	2.62	4.17	0.95	1.63	2.32	3.95	1.17	5.12
1915 ..	1.47	2.71	4.18	1.09	1.56	2.38	3.94	1.33	5.27
1916 ..	1.38	2.74	4.12	0.94	1.47	2.40	3.87	1.19	5.06
1917 ..	1.31	2.58	3.89	0.95	1.39	2.27	3.66	1.18	4.84
1918 ..	1.28	2.51	3.79	3.81	1.35	2.20	3.55	4.05	7.60
1919 ..	1.67	2.70	4.37	1.93	1.76	2.36	4.12	2.18	6.30
1920 ..	1.81	2.52	4.33	1.13	1.87	2.25	4.12	1.34	5.46
1921 ..	1.38	2.53	3.91	1.09	1.46	2.25	3.71	1.29	5.00
1922 ..	1.38	2.43	3.81	1.35	1.46	2.12	3.58	1.58	5.16
1923 ..	1.30	2.51	3.81	1.01	1.38	2.22	3.60	1.22	4.82
1924 ..	1.39	2.51	3.90	1.16	1.48	2.22	3.70	1.26	5.06
1925 ..	1.56	2.52	4.08	1.07	1.62	2.24	3.86	1.39	5.15
1926 ..	1.60	2.52	4.12	1.02	1.64	2.23	3.87	1.27	5.14
1927 ..	1.57	2.54	4.11	1.32	1.63	2.20	3.83	1.60	5.43
1928 ..	1.79	2.63	4.42	1.20	1.85	2.30	4.15	1.47	5.62
1929 ..	1.80	2.53	4.33	1.49	1.83	2.24	4.07	1.75	5.82
1930 ..	1.92	2.48	4.40	1.19	1.96	2.19	4.16	1.43	5.59
1931 ..	1.66	2.45	4.11	1.44	1.71	2.22	3.93	1.62	5.55

\* 911 deaths in 1931 (Table LVIII).

† 911 deaths in Table LVIII and 115 from puerperal nephritis and albuminuria



juries. As these deaths resulted from illegal interference with the pregnancy, it has not been the practice to include them in the maternal mortality rate, but as their occurrence is of some importance, mention is now made of them to complete the record of deaths associated with abortion. Their inclusion with the other maternal deaths would raise the rate to 5.68 per 1,000 (live) births.

For comparison of the deaths definitely assigned to pregnancy and childbirth with those so classed for years prior to 1911 deduction is required of 115 deaths from puerperal nephritis and albuminuria (included in No. 146, Table LVII), which before that date were not distinguished as puerperal. The resultant rate of 3.93 deaths per 1,000 live births is compared in Table LII with similar rates for the preceding forty years, before which the comparability of the figures is doubtful.

It will be seen from Table LII that the mortality from puerperal sepsis (1.66 per 1,000 live births) is lower than in the three preceding years but higher than in any other years except 1919-20 since the adoption of the International List in 1911. Higher rates were, however, recorded for the three quinquennia, 1891-1905, on the old system of classification. The mortality from non-septic conditions, which had decreased from 2.63 in 1928 to 2.48 in 1930, shows a further decline to 2.45, and is lower than in any year since 1922.

The increase in the maternal deaths associated with influenza and pneumonia from 134 in 1930 to 278 in 1931 largely accounts for the increase in the mortality from non-puerperal causes. The total maternal mortality based on all deaths with mention of a puerperal cause but excluding those from criminal abortion was 5.55 per 1,000 live births against 5.59 in 1930 and 5.51 in 1926-30.

As stated in previous Reviews, the danger to life is in general greater for primiparæ than for multiparæ as a whole. The mortality risk was found from Australian data collected in 1903 to be lower at the 2nd to 8th confinements, but higher at later births, than at the first\*. Recent Scottish data† suggest however that all confinements after the 4th now carry an average risk greater than the first.

Although the national registers afford no direct information regarding parity, it is possible by indirect methods to estimate the changes which must have occurred in the last two decades in the relative proportions of first and subsequent births. Notwithstanding the approximate nature of such estimates they suffice to show that the effect upon maternal mortality of the decline in the relative numbers of children born in the birth ranks of high order must have compensated for the contrary effect of the

\* Reports on Public Health and Medical Subjects. No. 25, 1924; pp. 6-10.

† Maternal Mortality and Morbidity. J. M. M. Kerr. 1933, p. 20.

increase in the proportion of first confinements, and it would seem that no excuse for the lack of improvement in the maternal mortality rate can therefore be found in the falling birth-rate.

Reliable statistics of stillbirths have been available since 1928, and as the total births, *i.e.*, live and stillbirths, provide a closer approximation to the number of women exposed to the risk of dying from puerperal conditions than do live births alone, the maternal mortality rates are shown in Table LIII calculated on both bases, and will continue to be so published for a sufficient period to enable statistical continuity to be assured.

TABLE LIII. England and Wales. Mortality of Women in or associated with Childbirth per Thousand Children born alive, and per Thousand Total Births (Live born and Still born).

	Per 1,000 live births.					Per 1,000 total births.				
	Puerperal Sepsis.	* Other puerperal causes.	* Total puerperal mortality.	Non-puerperal causes.	* Total maternal mortality.	Puerperal Sepsis.	* Other Puerperal causes.	* Total puerperal mortality.	Non-puerperal causes.	* Total maternal mortality.
1928 .. ..	1.79	2.63	4.42	1.20	5.62	1.72	2.52	4.25	1.15	5.39
1929 .. ..	1.80	2.53	4.33	1.49	5.82	1.73	2.43	4.16	1.43	5.59
1930 .. ..	1.92	2.48	4.40	1.19	5.59	1.84	2.38	4.22	1.14	5.36
1931 .. ..	1.66	2.45	4.11	1.44	5.55	1.59	2.35	3.95	1.38	5.33

\* Not including criminal abortion.

It will be observed that while the rates on the wider basis are naturally lower than those based on live births the ratio of the 1931 to the 1930 mortality remains practically unchanged.

The rates from individual causes according to the International List for each year 1921 to 1931, shown in Table 7, differ entirely from those in previous Reviews in that (i) they are based not upon populations but upon births, live births up to 1927, live and stillbirths from 1928 onwards; (ii) the Revised International List differs from the previous one by separating post-abortive sepsis from puerperal sepsis, and defining a new group of "other toxæmias of pregnancy" previously included in "other accidents of pregnancy"; (iii) the new group of non-septic abortion is subdivided for convenience in Tables 6, 7, LVI, into two groups, deaths from "hæmorrhage following abortion" which have hitherto been included without specification in the old group of "other accidents of pregnancy," and deaths from "abortion without record of hæmorrhage" which comprised the old "abortion" group. In view of the incomplete statement of the total deaths resulting from abortion in previous Reviews owing to inclusion of these hæmorrhagic deaths amongst "other accidents of pregnancy," the deaths attributed to or associated with abortion, now clearly defined in Tables 6, 7, 25 (supplementary group VI) and in the note to Table LVIII, have been brought together in Table LIV for each of the years 1926-31.



Table LIV.—England and Wales. Deaths attributed to or associated with Abortion, 1926–31.

Old List No.	New List No.		1926.	1927.	1928.	1929.	1930.	1931.
Part of 146	140	Post-abortivesepsis ..	222	215	224	238	300	229
	141	Abortion not returned as septic:—						
Part of 143c		(1) Hæmorrhage following abortion.	72	72	47	51	59	97
143a		(2) Without record of hæmorrhage.	86	82	77	67	65	21
199, 202	VI (Table 25).	Criminal abortion (inquest cases).	51	47	57	67	67	79
		Total attributed to abortion	431	416	405	423	491	426
		Associated with abortion but not classed to it.	?	?	83	182	77	77
		Total attributed to, and associated with abortion.	?	?	488	605	568	503

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.

The increase in the mortality attributed to abortion which occurred from 1928 to 1930 was followed by a fall in 1931. In 1932 the total of such deaths was 448, and the mortality for 1931–32 was not appreciably greater in proportion to the estimated population of women of reproductive ages than in 1926–27.

The excessive number of deaths associated with abortion but not classed to it in 1929 was mainly due to the influenza epidemic of that year (*see* Table LXIII of 1929 Review).

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, but no absolute statistical proof of this assertion is available from the record in the death registers as many of the medical certificates contain no mention of whether the sepsis followed abortion or delivery at term. The number of deaths classified to puerperal sepsis and stated to have occurred after abortion and the percentage of such deaths to the total deaths from puerperal sepsis for the years 1927–31 are as follows:—

1927	..	..	..	215	20.9
1928	..	..	..	224	18.9
1929	..	..	..	238	20.5
1930	..	..	..	300	24.1
1931	..	..	..	229	21.8

Had the total deaths from septic abortion shown an appreciable progressive increase during this period, it would not be unreasonable to expect some evidence of such increase in the number of deaths so returned on the medical certificates.

Evidence was given in the Review for 1930 that for the country as a whole the record of deaths from septic abortion is reasonably complete, but that the percentage of deaths from sepsis definitely returned as following abortion shows wide variations in the

several geographical regions and classes of area, being much higher in London and Wales than elsewhere, and higher in towns than rural areas.

It appears from Table LVII that in 1931 the ratio of post-abortive sepsis, No. 140, to total puerperal sepsis mortality (140, 145) increases with advancing age, being 17 per cent. at 15–25, 21 at 25–35 and 27 at ages 35 and upwards in the country as a whole. The percentage of all deaths from abortion (excluding the criminal cases) which is due to sepsis diminishes with age, being 80 at 15–25, 67 at 25–35 and 59 at ages 35 and upwards. The distribution throughout the country of the mortality ascribed to childbirth is outlined in Table LV according to a more detailed regional classification than hitherto.

As regards the distinction between town and country, the tendency noticed in previous years for mortality from sepsis to increase, and for that from other causes to decrease, with urbanization in some parts of the country is not so evident when Greater London is excluded from the aggregates, and only appears when London is compared with the Outer Ring. The sepsis rate for all towns, small and great, outside Greater London (1.60) is in fact exceeded by that for all rural districts (1.66), and the combined urban rate for other causes (2.60) slightly exceeds the rural rate (2.53). For the non-septic causes London, in agreement with the experience of recent years, gives the lowest rate of all the regions separated, but for sepsis the rate is exceeded only by North III and Wales II.

Table LV.—Distribution throughout England and Wales of Mortality of Women in Childbirth, distinguishing Septic and Other Causes, and of Prevalence of Puerperal Fever and Pyrexia, 1931.

	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.	All causes.	"Fever"	"Pyrexia"	Sepsis.	Other causes.	All causes.	"Fever."	"Pyrexia."	
England and Wales ..	1.66	2.45	4.11	3.7	9.1	1.59	2.35	3.95	3.6	8.7	223
South-East ..	1.65	1.92	3.57	3.7	10.2	1.60	1.86	3.45	3.6	9.8	223
Greater London ..	1.84	1.93	3.77	4.1	11.2	1.78	1.86	3.64	4.0	10.8	225
Remainder of South-East ..	1.35	1.91	3.25	2.9	8.5	1.30	1.84	3.15	2.8	8.2	217
North ..	1.79	2.88	4.67	4.0	8.8	1.70	2.75	4.46	3.8	8.4	222
North I ..	1.80	2.89	4.69	4.0	8.8	1.72	2.77	4.49	2.6	8.4	151
North II ..	1.96	3.08	5.04	3.0	7.1	1.88	2.95	4.84	2.9	6.8	152
North III ..	2.15	3.28	5.43	5.6	9.4	2.06	3.13	5.18	5.3	8.9	259
North IV ..	1.54	2.61	4.15	3.9	8.8	1.46	2.49	3.96	3.7	8.4	252
Midland ..	1.54	2.27	3.81	3.5	8.3	1.48	2.18	3.66	3.3	8.0	226
Midland I ..	1.45	2.23	3.68	3.7	9.2	1.39	2.14	3.53	3.6	8.8	255
Midland II ..	1.71	2.36	4.07	3.0	6.6	1.64	2.26	3.90	2.9	6.3	177
East ..	1.26	2.27	3.53	3.2	8.0	1.21	2.18	3.39	3.1	7.7	253
South West ..	1.36	2.31	3.66	2.6	10.1	1.30	2.21	3.52	2.5	9.7	195
Wales ..	1.89	3.54	5.43	4.2	7.6	1.78	3.34	5.12	3.9	7.2	221
Wales I ..	1.85	3.16	5.01	4.4	7.9	1.74	2.98	4.72	4.2	7.4	241
Wales II ..	2.02	4.72	6.74	3.4	6.9	1.91	4.47	6.38	3.2	6.6	167
County Boroughs* ..	1.64	2.29	3.92	4.7	10.1	1.57	2.19	3.75	4.5	9.6	288
Other Urban Districts* ..	1.57	2.98	4.55	2.8	7.8	1.50	2.85	4.35	2.7	7.5	180
Rural Districts* ..	1.66	2.53	4.19	2.8	7.1	1.59	2.43	4.02	2.7	6.8	169
Greater Admin. County ..	2.01	1.80	3.81	4.5	12.6	1.94	1.74	3.68	4.3	12.2	222
London Outer Ring ..	1.65	2.07	3.72	3.8	9.6	1.59	2.00	3.60	3.6	9.3	229

\* Excluding Greater London.



During the years 1919-31 the all puerperal causes rate for Wales has been uniformly above the average for England and Wales to an extent varying from 19 to 43 per cent., the excess being greater for non-septic causes than for sepsis. In 1931 the regions with highest sepsis rate are North III (the West Riding of Yorkshire) and Wales II (comprising the counties outside the industrial area). These two regions are also characterised by the highest rates for non-septic causes, the order being reversed. Next in both divisions come North II (the rest of Yorkshire with Cumberland and Westmorland) and Wales I. This more detailed analysis shows that, in 1931 at least, North II and III follow Wales II as regards total puerperal mortality, Wales I and the other northerly counties following next in order. The regions with lowest rates for sepsis are the East, South East excluding Greater London, and South West, and for non-septic causes the South East and Greater London.

As pointed out in the Review for 1930, the range of local variation is less for septic than for non-septic causes. Table LV shows that mortality from the former ranges from 126 to 215 per 100,000 live births in the regions now classified, whereas mortality from the latter ranges from 180 to 472.

Table LVI compares the mortality in 1931 with that in 1926-30 from the constituent headings of the group of puerperal

Table LVI.—Puerperal Mortality from various causes per 1,000 live births, 1926-30 and 1931.

		England and Wales.	London A.C.	North.	Rest of England.	Wales.
141 (1). Hæmorrhage following abortion ..	1926-30	0.09	0.05	0.11	0.07	0.15
	1931	0.15	0.09	0.16	0.15	0.24
141 (2). Abortion without record of hæmorrhage ..	1926-30	0.11	0.10	0.14	0.08	0.18
	1931	0.03	0.03	0.04	0.03	—
142. Ectopic gestation ..	1926-30	0.13	0.15	0.14	0.13	0.11
	1931	0.12	0.21	0.13	0.11	0.02
143. Other accidents of pregnancy ..	1926-30	0.03	0.03	0.03	0.02	0.03
	1931	0.04	0.03	0.05	0.03	0.05
144a. Placenta prævia ..	1926-30	0.24	0.14	0.28	0.21	0.38
	1931	0.22	0.18	0.26	0.19	0.33
144b. Other puerperal hæmorrhage ..	1926-30	0.26	0.19	0.32	0.23	0.32
	1931	0.24	0.12	0.32	0.19	0.31
146. Puerperal albuminuria and convulsions ..	1926-30	0.79	0.51	0.88	0.70	1.41
	1931	0.59	0.38	0.64	0.55	1.04
147. Other toxæmias of pregnancy ..	1926-30	0.08	0.02	0.14	0.05	0.12
	1931	0.21	0.09	0.30	0.16	0.24
148a. Puerperal phlegmasia alba dolens not returned as septic ..	1926-30	0.04	0.01	0.05	0.04	0.06
	1931	0.07	0.02	0.07	0.07	0.19
148b. Puerperal embolism and sudden death ..	1926-30	0.25	0.14	0.30	0.23	0.34
	1931	0.22	0.12	0.27	0.20	0.35
149. Other accidents of childbirth ..	1926-30	0.41	0.28	0.46	0.38	0.51
	1931	0.47	0.43	0.52	0.42	0.76
150 (1). Puerperal insanity ..	1926-30	0.03	0.02	0.04	0.02	0.05
	1931	0.02	0.02	0.04	0.01	—
150 (2). Puerperal diseases of breast ..	1926-30	0.01	0.01	0.01	0.01	0.01
	1931	0.02	0.05	0.02	0.01	0.02
150 (3). Childbirth (unqualified) ..	1926-30	0.06	0.03	0.07	0.05	0.10
	1931	0.04	0.03	0.07	0.03	—
Non-septic causes ..	1926-30	2.54	1.70	2.98	2.23	3.76
	1931	2.45	1.80	2.88	2.14	3.54
140. Post-abortive sepsis ..	1926-30	0.36	0.54	0.40	0.29	0.41
	1931	0.36	0.64	0.36	0.29	0.47
145. Puerperal sepsis not returned as abortive ..	1926-30	1.37	1.12	1.52	1.30	1.47
	1931	1.30	1.37	1.43	1.18	1.42
Total puerperal causes ..	1926-30	4.28	3.35	4.90	3.82	5.64
	1931	4.11	3.81	4.67	3.61	5.43

causes in the Detailed List of Causes of Death. These details afford the means of analysing the extent to which these causes individually contribute to the total puerperal mortality of several geographical divisions of the country during the two periods.

Mortality from all non-septic causes was lower in 1931 than the average for the preceding quinquennium by 6 per cent. in Wales, 3 per cent. in the North and 4 per cent. in the rest of England, but in London the increase from 1911-20 to 1926-30, revealed in Table LXI of the Review for 1930 is continued in 1931.

Of the causes distinguished in the Table, ectopic gestation registers a further increase in London, but not elsewhere. It is probable, however, that this recorded increase is due to greater accuracy in diagnosis, which is suggested by its being the only non-septic cause of any importance having the highest mortality in London.

Abortion with hæmorrhage shows an increase in every area, more than offset in most instances by a decrease in abortion without record of hæmorrhage, this being no doubt due to greater precision in certification. Placenta prævia and other puerperal hæmorrhage combined show a slightly lower rate in every area than in 1926-30, following upon a decline since 1911-20 (see Table LXI in the Review for 1930).

Puerperal albuminuria and convulsions also register a decline in all areas, almost offset by increases for other toxæmias of pregnancy, whilst phlegmasia alba dolens shows small increases in all areas which are offset, except in Wales, by corresponding decreases for puerperal embolism. Mortality from these four causes continues to be highest in Wales and lowest in London.

Table 18 indicates that the ratio of stillbirths to 1,000 total births is also highest in Wales, 57, followed by the North, 45, and lowest in Greater London, 33, and the remainder of the South East, 34.

There can be little doubt that London owes its favourable position as regards non-septic mortality to the more adequate provision of lying-in accommodation in its many Hospitals and other institutions.

It was shown in the Review for 1930 that a much larger proportion of live births occur in institutions in London than elsewhere, and that this proportion is very low in Wales.

Compared with 1911-20 (see Table LXI in the Review for 1930), the mortality from puerperal sepsis during 1926-30 showed an appreciable increase in all areas, but in comparison with 1926-30 (Table LVI) a decline is manifest in 1931 in all areas except Wales, which shows little change, and London which shows a considerable increase. The London rates have risen year by year since 1927, the successive values being 1.31, 1.59, 1.88, 1.93, 2.01.

Table LVII gives particulars of all deaths ascribed to the puerperal state with a statement of the civil condition and age of the deceased.



Table LVII.—England and Wales, 1931: Deaths of Women  
Classed to Pregnancy and Childbearing.

Cause of Death.	All Ages.	Civil Condition.			Ages.						
		Single.	Married.	Widowed.	15-	20-	25-	30-	35-	40-	45 and upwards
140. Post-abortive sepsis*	229	34†	189	6	6	34	46	67	52	23	1
Streptococcal infection	8	—	8	—	—	—	—	—	—	—	—
Pneumococcal infection	1	—	1	—	—	1	—	—	—	—	—
Gonorrhœal infection	1	—	1	—	—	—	—	—	1	—	—
Gas gangrene	1	—	1	—	—	—	1	—	—	—	—
Septic phlegmasia alba dolens, phlebitis, thrombosis.	4	—	4	—	—	—	1	2	1	—	—
Septic pneumonia	6	1†	5	—	—	2	1	1	—	2	—
Septicæmia	106	17	87	2	4	12	19	31	28	12	—
Sepsis	8	1†	7	—	—	1	2	2	3	—	—
Septic intoxication, sapræmia	10	—	9	1	—	—	1	4	3	2	—
Pelvic peritonitis	6	1	4	1	1	—	3	2	—	—	—
Peritonitis	31	7	23	1	—	7	10	10	2	2	—
Salpingitis	7	—	7	—	—	—	2	3	—	1	1
Metritis	1	—	1	—	—	—	—	1	—	—	—
Endometritis	17	1	15	1	—	1	1	4	8	2	—
Parametritis	1	—	—	—	—	—	—	—	—	—	—
Pyæmia	9	3	6	—	—	4	2	3	—	—	—
Pelvic cellulitis	4	—	4	—	—	1	1	—	2	—	—
Pelvic abscess	1	—	—	—	—	—	—	—	—	—	—
Septic abscess pouch of Douglas	1	—	—	—	—	—	—	—	—	—	—
Tetanus	2	1	1	—	—	1	—	—	1	—	—
"Puerperal fever"	4	—	4	—	—	2	—	1	1	—	—
141. Abortion not returned as septic*	118	5	113	—	1	9	22	33	29	19	5
(1) Hæmorrhage following abortion	97	2	95	—	1	6	18	31	23	14	4
(2) Without record of hæmorrhage	21	3	18	—	—	3	4	2	6	5	1
142. Ectopic gestation	79	4	74	1	—	6	20	20	28	4	1
143. Other accidents of pregnancy	23	—	23	—	—	2	3	4	6	3	3
Hydatidiform mole	11	—	11	—	1	2	2	1	1	2	2
Carneous mole	1	—	1	—	—	—	—	1	—	—	—
Retroverted gravid uterus	3	—	3	—	—	—	—	—	2	1	—
Hydræmia	7	—	7	—	1	—	—	2	3	—	1
"Pregnancy" unqualified	1	—	—	—	—	1	—	—	—	—	—
144. Puerperal hæmorrhage	289	10	276	3	2	33	55	85	67	44	3
(a) Placenta prævia	139	6	132	1	1	6	29	43	34	24	2
(b) Other puerperal hæmorrhage	150	4	144	2	1	27	26	42	33	20	1
Adherent or retained placenta	44	1	42	1	—	7	8	16	8	5	—
Post-partum hæmorrhage	88	3	84	1	1	18	16	21	22	9	1
Accidental hæmorrhage	18	—	18	—	—	2	2	5	3	6	—
145. Puerperal sepsis not returned as post-abortive.	821	42	771	8	30	162	224	203	142	58	1
(a) Puerperal septicæmia and pyæmia	820	42	770	8	30	162	224	203	142	58	1
Scarlet fever	3	—	3	—	—	—	2	1	—	—	—
Streptococcal infection	30	1	29	—	1	6	7	8	6	2	—
Pneumococcal infection	2	—	2	—	—	1	—	1	—	—	—
Staphylococcal infection	4	1	3	—	—	1	—	—	2	—	—
Bacillus coli infection	1	—	1	—	—	—	1	—	—	—	—
Gas gangrene	3	1	2	—	—	1	—	1	1	—	—
Septic phlegmasia alba dolens, phlebitis, thrombosis.	41	2	39	—	—	2	7	16	10	6	—
Septic pneumonia	12	1	11	—	—	3	4	1	2	2	—
Septic endocarditis	5	1	4	—	—	2	1	1	—	1	—
Septicæmia	334	14	316	4	10	63	89	83	67	21	1
Sepsis	75	3	71	1	1	13	24	23	10	4	—
Septic intoxication, sapræmia	26	1	25	—	—	6	6	7	6	—	—
Pelvic peritonitis	16	3	13	—	2	5	4	1	4	—	—
Peritonitis	66	2	64	—	4	19	16	14	12	1	—
Salpingitis	14	2	12	—	2	4	2	5	1	—	—
Metritis	4	—	4	—	—	1	—	—	1	1	—
Endometritis	38	4	33	1	1	3	7	13	6	8	—
Parametritis	9	—	9	—	—	—	3	4	2	—	—
Perimetritis	2	—	2	—	—	—	1	—	—	—	—
Erysipelas	2	—	2	—	—	—	1	1	—	—	—
Pyæmia	28	1	26	1	1	8	8	3	3	5	—
Pelvic cellulitis	17	1	16	—	1	2	5	2	3	4	—
Cellulitis	3	—	3	—	—	1	—	1	1	—	—
Pelvic abscess	9	—	9	—	—	2	1	3	2	1	—
Other specified septic conditions	5	—	5	—	—	3	2	—	—	—	—
"Puerperal fever"	71	4	66	1	2	18	29	15	5	2	—
(b) Puerperal tetanus	1	—	—	—	—	—	—	1	—	—	—
146. Puerperal albuminuria and convulsions	375	31	342	2	19	81	87	91	59	34	4
147. Other toxæmias of pregnancy	131	7	124	—	5	25	48	25	17	9	2
Chorea	6	1	5	—	2	3	1	—	—	—	—
Toxæmia of pregnancy	62	3	59	—	3	13	19	15	5	6	1
Puerperal toxæmia	5	—	5	—	—	—	3	—	2	—	—
Uncontrollable vomiting	58	3	55	—	—	9	25	10	10	3	1

Table LVII.—England and Wales, 1931: Deaths of Women  
Classed to Pregnancy and Childbearing—continued.

Cause of Death.	All Ages.	Civil Condition.			Ages.						
		Single.	Married.	Widowed.	15-	20-	25-	30-	35-	40-	45 and upwards
148. Puerperal phlegmasia alba dolens, embolism and sudden death.	188	9	179	—	6	21	49	58	35	18	1
(a) Puerperal phlegmasia alba dolens, not returned as septic.	47	2	45	—	1	4	10	13	13	5	1
(b) Puerperal embolism and sudden death.	141	7	134	—	5	17	39	45	22	13	—
149. Other accidents of childbirth	300	11	289	—	1	43	90	78	47	34	7
Contracted pelvis	82	4	78	—	—	11	31	26	8	6	—
Craniotomy	2	—	2	—	—	—	—	1	1	—	—
Instrumental delivery	7	2	5	—	—	—	4	3	—	—	—
Malpresentation	25	2	23	—	—	4	9	7	4	1	—
Version	3	—	3	—	—	—	—	1	2	—	—
Impacted foetus	2	—	2	—	—	1	—	1	—	—	—
Abnormal foetus	7	—	7	—	—	1	—	2	3	1	—
Difficult and prolonged labour	83	1	82	—	1	13	22	21	11	12	3
Cæsarean section (reason unstated) §.	10	—	10	—	—	—	3	2	3	1	1
Rupture of Cæsarean scar	4	—	4	—	—	2	1	1	—	—	—
Rupture of uterus	21	1	20	—	—	2	2	5	5	6	1
Laceration of cervix	3	—	3	—	—	1	—	—	—	2	—
Tear of perineum	3	—	3	—	—	1	2	—	—	—	—
Rupture of spleen	1	—	1	—	—	—	—	—	—	1	—
Trauma of urethra and bladder	1	—	1	—	—	—	—	—	1	—	—
Inversion of uterus	8	—	8	—	—	3	4	1	—	—	—
Extroversion of uterus	1	—	1	—	—	—	1	—	—	—	—
Subinvolution of uterus	2	—	2	—	—	—	—	—	—	2	—
Uterine inertia	10	1	9	—	—	1	3	2	2	2	—
Contraction of uterus	1	—	1	—	—	—	—	—	1	—	—
Rigid cervix	1	—	1	—	—	—	1	—	—	—	—
Adherent and retained placenta	7	—	7	—	—	1	3	1	—	1	1
Detached placenta	1	—	1	—	—	—	1	—	—	—	—
Precipitate labour	4	—	4	—	—	—	1	1	1	—	1
Stillbirth	3	—	3	—	—	1	1	—	—	1	—
Twin birth	8	—	8	—	—	1	1	3	3	—	—
150. Other or unspecified conditions of the puerperal state.	48	3	43	2	3	9	6	13	13	3	1
(1) Puerperal insanity	13	—	13	—	—	2	3	2	5	1	—
(2) Puerperal diseases of the breast	11	1	10	—	—	1	3	—	3	4	—
(3) Childbirth (unqualified)	24	2	20	—	—	3	4	5	8	3	1
(With secondary causes as follows):											
Anæmia	8	—	7	1	—	—	—	—	5	2	1
Myocarditis	2	—	2	—	—	—	—	—	1	1	—
Pneumonia	2	—	2	—	—	—	—	1	—	1	—
Broncho-pneumonia	2	1	—	1	—	—	—	1	—	—	—
Empyema	1	1	—	—	—	—	—	1	—	—	—
Pleurisy	1	—	1	—	—	—	—	—	1	—	—
Without stated secondary cause	8	—	8	—	—	1	3	2	1	1	—
Total	2,601	—	—	—	75	426	649	678	495	249	29
Single	—	156	—	—	27	54	37	24	9	5	—
Married	—	—	2,423	—	48	371	607	650	478	240	29
Widowed	—	—	—	22	—	1	5	4	8	4	—

\* In addition to these 229 deaths from post-abortive sepsis and 118 deaths from abortion not returned as septic, there were 79 (Single 20, Married 56 and Widowed 3) others from criminal abortion (see Table 25 (Supplementary Tabulation VI)).

† Including 2 divorced



The proportion to live births of puerperal fever cases notified rose from 30 in 1927 to 40 in 1930, and fell to 37 per 10,000 in 1931. This proportion 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 and the ratio both to live births and to total confinements are shown in Table LV. It is noticeable that whilst the South West region gives the lowest "fever" rate, the pyrexia rate for this region is second only to that of the South East. A similar inverse relation is shown by Wales I, which has a low pyrexia rate but a fever rate only exceeded by North III, the West Riding. South East England, including London, with an average fever rate, ranks highest for pyrexia.

As pointed out in previous Reviews the totals of notified "fever" cases in each year since 1921 (Table 28) give no indication of any important effect of the introduction of pyrexia notification in 1926 upon the fever rate in the country as a whole by transfer to the new group. On the contrary the fever rate has increased in all areas since pyrexia notification began. Comparison of the mean fever rates in two periods 1921-25 and 1927-30, before and after its introduction, is made below for different parts of the country according to the regional division then in use. To these is added a similar comparison of the mean mortality rates from puerperal sepsis.

Rates per 10,000 Live Births.

	Puerperal Fever Cases.			Puerperal Sepsis Deaths.			Pyrexia Cases.
	1921-25.	1927-30.	Per cent. Rise.	1921-25.	1927-30.	Per cent. Rise.	1927-30.
England and Wales .. .. .	29	36	24	14.0	17.7	26	85
London—Admin. County .. .	36	41	14	13.6	16.8	24	112
County Boroughs .. .	41	48	17	16.9	20.5	21	88
Other Urban Districts.. .	23	27	17	14.3	18.4	29	76
Rural Districts .. .	17	28	65	13.4	18.5	38	65
Midlands { County Boroughs .. .	43	45	5	15.1	16.4	9	92
Other Urban Districts.. .	25	28	12	12.3	15.5	26	77
Rural Districts .. .	19	29	53	11.0	17.3	57	74
South { County Boroughs .. .	20	38	90	13.5	17.4	29	115
Other Urban Districts.. .	21	26	24	10.4	15.0	44	92
Rural Districts.. .	17	24	41	12.2	16.8	38	77
Wales .. .. .	23	36	57	16.3	19.5	20	72

For the whole country the fever case rate increased in virtually the same proportion as did the sepsis death-rate, but for the Southern county boroughs an increase greatly in excess of that for mortality brought their fever rate into line with that of London. For London and these Southern towns the pyrexia rate has since its inception been higher than in any aggregate except the Welsh county boroughs. In Wales and the rural districts of the North the fever rate also increased to a considerably greater extent than the mortality rate, and in all these areas a more complete recording of "fever" cases seems to have resulted from the introduction of pyrexia notification. In London and the small

towns the increase in cases fell short of that for mortality, due perhaps to transfer of mild cases which would previously have been notified as fever to the pyrexia group.

The proportion of puerperal fever cases to sepsis deaths, shown for 1931 by regions in Table LV, is lowest in North I and II,

Table LVIII.—England and Wales, 1931 : Deaths of Women not classed to Pregnancy and Childbearing, but returned as associated therewith.

Cause of Death.	All Ages.	Ages.						
		15-	20-	25-	30-	35-	40-	45 and upwards.
7 Measles .. .. .	1	—	—	—	—	1	—	—
8 Scarlet fever .. .. .	7	1	1	3	2	—	—	—
11 Influenza .. .. .	94	1	10	25	23	18	14	3
16 (1) Anterior poliomyelitis .. .	1	—	1	—	—	—	—	—
23 Tuberculosis of respiratory system.	82	3	20	24	15	15	5	—
24-32 Other forms of tuberculosis	16	—	3	7	3	1	2	—
34 (a) Congenital syphilis .. .	1	—	1	—	—	—	—	—
34 (b)(c) Syphilis acquired or unspecified.	4	—	1	1	—	1	1	—
35 (2) Gonococcal arthritis .. .	1	—	1	—	—	—	—	—
44 (5) Mumps .. .. .	1	—	—	—	1	—	—	—
45-53 Cancer .. .. .	14	—	—	—	6	5	3	—
54 (a) & 55 (a) Tumours of female genital organs.	12	—	1	—	2	6	1	2
54 (b) Cerebral tumour .. .. .	1	—	—	—	—	—	1	—
56 Rheumatic fever .. .. .	5	—	—	2	1	2	—	—
59 Diabetes .. .. .	10	1	—	2	3	1	3	—
65 (2) Pituitary insufficiency .. .	1	—	1	—	—	—	—	—
66 (a) Goitre .. .. .	1	—	—	—	—	1	—	—
66 (b) Exophthalmic goitre .. .	8	—	—	4	2	1	1	—
68 Hypoplasia of suprarenals.. .	1	—	—	—	—	—	1	—
70 (a) Purpura .. .. .	1	—	—	1	—	—	—	—
71 (a) Pernicious anæmia .. .. .	15	1	1	3	2	7	1	—
71 (b) (1) Splenic anæmia .. .. .	1	—	—	—	—	—	1	—
71 (b) (2) Anæmia .. .. .	1	—	—	—	—	1	—	—
72 (a) Leukæmia .. .. .	2	—	—	1	1	—	—	—
78 (b) Encephalitis (non-specific).. .	1	—	—	—	1	—	—	—
79 Meningitis .. .. .	2	—	—	—	1	—	1	—
81 (2) Sub-acute combined degeneration of cord.	1	—	—	—	—	1	—	—
81 (4) Spastic paraplegia .. .. .	1	—	—	—	1	—	—	—
82 (a) Cerebral hæmorrhage .. .	2	—	—	1	—	—	1	—
82 (b) (1) Cerebral embolism .. .	1	—	—	1	—	—	—	—
85 Epilepsy .. .. .	7	—	3	4	—	—	—	—
87 (a) Chorea .. .. .	1	—	—	1	—	—	—	—
87 (c) Paralysis agitans .. .. .	1	—	—	—	—	1	—	—
87 (d) Disseminated sclerosis .. .	1	—	—	—	—	—	1	—
90 Pericarditis .. .. .	1	—	—	—	1	—	—	—
91 (1) Malignant endocarditis .. .	6	1	1	1	1	2	—	—
91 (2) Other acute endocarditis .. .	2	—	—	1	1	—	—	—
92 (2) Mitral valve disease .. .	101	1	9	26	26	27	10	2
92 (1, 3, 4, 5) Other or unspecified valvular disease.	51	—	4	14	11	16	5	1
93 (b) (1) Fatty heart .. .. .	21	—	2	4	4	7	4	—
93 (b) (3), 93 (c) Other or unspecified myocardial disease.	32	—	1	6	8	10	7	—



Table LVIII.—England and Wales, 1931 : Deaths of Women not classed to Pregnancy and Childbearing, but returned as associated therewith—*continued*.

Cause of Death.	All Ages.	Ages.						
		15-	20-	25-	30-	35-	40-	45 and upwards.
94 Diseases of the coronary arteries, angina pectoris.	2	—	—	—	1	1	—	—
95 Other diseases of the heart	12	—	1	3	3	4	—	1
99 Gangrenous mesenteric cyst	1	—	—	—	1	—	—	—
100 (1) Varix .. .. .	6	—	—	2	2	1	1	—
100 (2) Other diseases of the veins ..	4	—	—	—	3	—	1	—
105 (2) Laryngitis .. .. .	1	—	—	—	1	—	—	—
106 Bronchitis .. .. .	12	—	—	5	2	3	2	—
107 Broncho-pneumonia .. .. .	50	1	9	9	11	11	9	—
108 Lobar pneumonia .. .. .	113	1	15	23	21	37	14	2
109 Pneumonia (not otherwise defined).	21	—	2	3	7	6	3	—
110 (1) Empyema .. .. .	1	—	—	—	—	1	—	—
110 (2) Other pleurisy .. .. .	8	—	—	2	2	2	2	—
111 Congestion and hæmorrhagic infarct of lung, etc.	3	—	1	—	—	—	2	—
112 Asthma .. .. .	7	1	—	—	2	3	1	—
115 (1) Oral sepsis .. .. .	1	—	—	—	—	—	—	1
115 (3) Tonsillitis .. .. .	1	—	1	—	—	—	—	—
115 (4) Pharyngitis .. .. .	1	—	—	1	—	—	—	—
117 (a) Ulcer of stomach .. .. .	4	—	—	3	1	—	—	—
118 (1) Gastritis .. .. .	1	—	—	—	1	—	—	—
121 Appendicitis .. .. .	8	—	2	2	1	1	2	—
122 (a) (1) Strangulated ventral hernia.	1	—	—	—	—	1	—	—
122 (a) (2) Ventral hernia .. .. .	1	—	—	—	—	1	—	—
122 (b) Intestinal obstruction .. .. .	42	—	7	14	9	6	5	—
125 (1) Acute yellow atrophy .. .. .	26	—	5	6	6	8	—	1
126 (1) Biliary calculi with cholecystitis.	1	—	—	—	1	—	—	—
128 Hæmorrhagic pancreatitis .. .. .	1	—	—	—	1	—	—	—
131 Chronic nephritis .. .. .	54	2	5	8	13	14	12	—
135 (a) Cystitis .. .. .	1	—	—	—	1	—	—	—
139 (b) Diseases of the uterus .. .. .	2	—	—	—	1	1	—	—
151 Boil .. .. .	1	—	—	—	—	1	—	—
154 Pyæmic necrosis neck of femur.	1	—	—	—	—	1	—	—
156 (a) Abscess sacro-iliac joint (not tubercular).	1	—	—	—	1	—	—	—
157 (e) Congenital heart lesion .. .. .	1	—	1	—	—	—	—	—
163-198 Violence .. .. .	8	—	2	2	2	2	—	—
Total .. .. .	911*	14	112	215	210	228	118	14
Single .. .. .	39	3	18	9	4	3	2	—
Married .. .. .	868	11	94	204	206	225	114	14
Widowed .. .. .	4	—	—	2	—	—	2	—

\* Of these 911 deaths, 206 were stated to be associated with pregnancy, 77 with abortion, 47 with premature delivery, 14 with delivery at full term, and 567 with childbirth.

Midland II and Wales II, and highest in Midland I, North III, North IV and the East, the range of variation being from 151 to 259 cases notified per 100 deaths.

Table LVIII shows the causes of deaths stated to have been complicated by the existence of the puerperal state. The largest numbers in this table are—lobar pneumonia 113, mitral disease 101, influenza 94, respiratory tuberculosis 82, chronic nephritis 54, other or unspecified valvular disease 51, and broncho-pneumonia 50. For heart disease of all forms the total is 228. These deaths are of much the same type year after year, heart disease, pneumonia (conceivably septic), and influenza when epidemic, generally figuring prominently in the table. Of 47 deaths of females at all ages from acute yellow atrophy of the liver, and 39 at 15-45 (Table 21), 26 were stated to have been associated with pregnancy or childbearing.

186. **Crushing by Motor Vehicles (not on railways).**—As 1931 is the first year of the operation of the new Road Traffic Act (1930) the figures are of special interest.

Table LIX.—England and Wales, 1927-31—Deaths, and Death Rates per Million Living, caused by various Types of Road Motor Vehicles in each year.

	Deaths.					Rate per Million Living.				
	1927.	1928.	1929.	1930.	1931.	1927.	1928.	1929.	1930.	1931.
Electric tram .. .. .	84	101	89	73	74	2.1	2.6	2.2	1.8	1.9
Motor car .. .. .	1,292	1,550	1,660	1,643	1,688	32.9	39.2	41.9	41.3	42.2
Motor van, lorry, steam wagon, etc.	956	938	1,162	1,273	1,209	24.3	23.8	29.3	32.0	30.2
Motor omnibus .. .. .	427	557	584	692	529	10.9	14.1	14.7	17.4	13.2
Motor cycle .. .. .	940	1,043	1,162	1,286	1,083	23.9	26.4	29.3	32.3	27.1
Others .. .. .	753	1,007	1,095	1,375	1,309	19.2	25.5	27.6	34.5	32.7
All road vehicles .. .. .	4,452	5,196	5,752	6,342	5,892	113.3	131.6	145.2	159.3	147.3

Apart from 399 deaths on railways and 74 caused by aircraft, there were 5,892 accidental deaths attributed to mechanically-propelled vehicles in 1931, 4,318 of males and 1,574 of females. The rate of mortality per million persons was 147, compared with 159 in 1930. In Table LIX, the allocation of deaths to the different types of mechanically-propelled road vehicles is shown. The deaths classified as "Others" in 1931 are made up as follows:—

Motor cab, 45; motor char-a-banc, 111; motor tractor, 6; steam roller, 4; other, or undefined motor, 15; and collisions involving a motor vehicle, the vehicle causing death not being stated, 1,128.

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 LIX less complete than it would otherwise have been. The decrease in mortality compared with the previous year was mainly due to motor cycles and motor omnibuses, the combined rate attributed to these being 40 per million compared with 50 in 1930 and 44 in 1929.



199, 200. Ill-defined Diseases.—These headings in the International List of Causes of Death, to which 1,347 deaths have been allocated, exclude the ill-defined diseases of infancy and old age, 158 and 162 (b). In the more comprehensive sense resulting from their inclusion, the deaths from ill-defined causes in 1931 numbered 20,127, or 4.09 per cent. of the total, as compared with 4.21 in 1930 and 9.67 in 1911.

Table LX.—England and Wales, 1931 : Replies to Inquiries respecting Indefinitely Certified Causes of Death.

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
Croup .. ..	18	18	Diphtheria 2, Laryngismus stridulus 4, Laryngitis 7.
Membranous laryngitis.	1	1	Laryngitis 1.
Pyæmia, septicæmia, etc.	216	192	Diseases of the teeth and gums 13, Diseases of the tonsils, 19, Puerperal sepsis 5, Diseases of the skin 32.
Tuberculosis ..	87	85	Tuberculosis of the respiratory system 55, Tuberculosis of the central nervous system 2, Tuberculosis of intestines and peritoneum 5, Tuberculosis of other bones and joints 3, Tuberculosis of lymphatic system 2, Tuberculosis of genito-urinary system 2, Disseminated tuberculosis 5, Other forms of tuberculosis 5.
Cancer (part of organ not stated)	1,059	1,029	Part or organ stated in 1,017 cases.
Cerebral tumour (P.M. cases)	234	228	Tuberculosis of the central nervous system 7, Syphilis 8, Cancer 70, Glioma 82.
Tumour of other sites	804	730	Syphilis 3, Cancer 461.
Rheumatism ..	445	442	Rheumatic fever 149, Chronic rheumatism 4, Rheumatoid arthritis 6, Rheumatic heart disease 258.
Encephalitis ..	212	190	Whooping cough 2, Influenza 34, Poliо-encephalitis 2, Encephalitis lethargica 71, Tuberculosis of central nervous system 5, Syphilis 6, Other forms of encephalitis 32, Meningitis 7.
Basal or basic meningitis	31	30	Cerebro-spinal fever 6, Tuberculosis of central nervous system 11, Meningitis—other forms 5.
Posterior or post basal or post basic meningitis	56	55	Cerebro-spinal fever 41, Tuberculosis of central nervous system 4, Meningitis—other forms 6.

Table LX.—England and Wales, 1931 : Replies to Inquiries respecting Indefinitely Certified Causes of Death—continued.

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
Cerebro-spinal meningitis	207	203	Measles 1, Influenza 3, Encephalitis lethargica 1, Cerebro-spinal fever 175, Tuberculosis of central nervous system 7, Meningitis—other forms 9.
Spinal sclerosis ..	25	24	Tabes dorsalis 2, Other diseases of the spinal cord 12, Disseminated sclerosis 10.
Cerebral sclerosis ..	7	6	Syphilis 1, Disseminated sclerosis 5.
Paraplegia .. ..	44	40	Syphilis 4, Other diseases of the spinal cord 11, Disseminated sclerosis 2.
General paralysis (outside asylums)	33	32	Encephalitis lethargica 1, General paralysis of insane 25.
Paralysis .. ..	23	22	Tuberculosis of vertebral column 1, Tabes dorsalis 1, Other diseases of the spinal cord 4, Cerebral hæmorrhage, apoplexy, etc. 5.
Aortitis, arteritis and endarteritis	135	125	Syphilis 59, Aneurysm 1, Arterio sclerosis 8.
Fibroid phthisis ..	81	79	Tuberculosis of the respiratory system 68, Chronic interstitial pneumonia 5.
Hæmoptysis ..	15	13	Tuberculosis of the respiratory system 9.
Stomatitis .. ..	22	20	Syphilis 1, Thrush, aphthous stomatitis 3.
Stricture of œsophagus	42	39	Cancer 22.
Hæmatemesis ..	26	21	Cancer 1, Ulcer of stomach or duodenum 17.
Pyloric stenosis, obstruction, etc.	43	39	Cancer 11, Ulcer of stomach or duodenum 20.
Jaundice .. ..	68	61	Influenza 2, Syphilis 4, Cancer 13, Cirrhosis of the liver 2, Biliary calculi 3, Diseases of the pancreas 2.
Peritonitis .. ..	78	63	Influenza 2, Bacillary dysentery 1, Tuberculosis of intestines and peritoneum 3, Cancer 3, Ulcer of stomach or duodenum 10, Appendicitis 5, Intestinal obstruction 4, Diseases of the female genital organs 5, Puerperal sepsis 3.
Pemphigus of infants	83	74	Syphilis 10.
Hydrocephalus ..	81	76	Tuberculosis of central nervous system 2, Syphilis 3, Congenital hydrocephalus 47.



Table LX.—England and Wales, 1931: Replies to Inquiries respecting Indefinitely Certified Causes of Death—*continued.*

Subject of Inquiry.	Replies received.	Replies amplifying previous information.	Deaths allocated as the result of inquiry to certain headings.
Violence .. ..	528	519	Precise form of suicide 121, Drowning 2, Injury by fall 77, Injury in mines and quarries 34, Injury by machinery 9, Injury by crushing 119.
Syncope, heart failure	120	105	Diphtheria 1, Influenza 2, Syphilis 3, Cancer 1, Rheumatic fever 3, Diseases of the heart 63, Arterio sclerosis 3, Lobar pneumonia 4, Ulcer of stomach and duodenum 2, Nephritis 3.
Operation .. ..	577	566	Cancer 43, Tumours of female genital organs 50, Ulcer of stomach and duodenum 39, Appendicitis 26, Hernia, intestinal obstruction 52, Biliary calculi 69, Diseases of the prostate 30, Diseases of the female genital organs 40, Congenital malformations 6, Violence 12.
Other indefinite forms of certification	2,469	2,288	—
Total .. ..	7,870	7,415	—

Inquiries sent to medical practitioners and coroners requesting further information as to indefinitely certified deaths amounted to 8,554, and to these 7,870 replies were received, with results to classification, some of the most important of which are set out in Table LX.

The total additions to certain definite headings resulting from these inquiries were as follows:—To influenza, 85; to encephalitis lethargica, 76; to cerebro-spinal fever, 231; to tuberculosis of the respiratory system, 186; to other forms of tuberculosis, 127; to venereal diseases, 177; to cancer, 680; to diseases of the spinal cord, 46; to general paralysis of the insane, 30; to disseminated sclerosis, 22; to arterio sclerosis, 53; to ulcer of stomach and duodenum, 136; to appendicitis, 57; to biliary calculi, 89; to chronic nephritis, 139; to diseases of the prostate, 68; to puerperal sepsis, 53; to congenital malformations, 88.

In addition to the foregoing, 1,420 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 1,114 replies received to these inquiries, 457 amended the original certification.

**Anæsthetics.**—The usual annual statement is continued of deaths during or connected with the administration of an anæsthetic. 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 LXI, 723, is 16 more than in 1930 but 7 less than in 1929, and is more than double that of any year prior to 1916. During the years for which fully comparable figures can be stated these deaths first increased slowly from 276 in 1911 to 336 in 1922 (366 in 1920) and then rapidly to 730 in 1929.

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 1931 the 723 deaths included 96 associated with cancer, and 47 with hernia. So for comparison with the years prior to 1911 the number of deaths should be reduced to 580. But during 1901–10 the deaths ranged from 133 (1901) to 234 (1910).

Subject to allowance, on the scale indicated by this reduction, for the more comprehensive nature of the figures from 1911 onwards, the records of the present century may be compared as in Table LXII.

The increase since 1911–15 is very general in its application to sex and age, but affects chiefly the aged of both sexes. It is least for males of 25–45 and females of 15–25 years.

In 1931, deaths of females were in excess of males at ages 25–45 but males were in excess at other ages.

The anæsthetic agents recorded on death certificates have altered greatly during the present century. The following statement records the proportion, per cent. of all deaths, under anæsthetics of stated type, associated with the exclusive administration at different periods of chloroform, ether, chloroform and ether, and alcohol, chloroform and ether (A.C.E. mixture), respectively:—

	Chloroform.	Ether.	Chloroform and Ether.	A.C.E.	Other or mixed.
1901–05 .. ..	84	7	2	3	4
1906–10 .. ..	76	9	8	2	5
1911–15 .. ..	62	14	15	4	5
1916–20 .. ..	45	19	27	3	6
1921–25 .. ..	23	28	34	4	11
1926–30 .. ..	16	35	30	1	18
1927 .. ..	18	30	30	2	20
1928 .. ..	18	36	32	1	13
1929 .. ..	15	37	29	1	18
1930 .. ..	13	37	30	1	19
1931 .. ..	13	35	29	1	22



Table LXI.—England and Wales, 1931 : Deaths under or connected with the Administration of various Anæsthetics.

Anæsthetic.	All Ages.	Age.													
		0-	1-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	65-
Chloroform .. .. .	{M. 58 F. 37}	1	6	1	2	6	3	1	5	4	6	3	5	7	8
Chloroform and ether .. .. .	{M. 126 F. 79}	4	6	11	6	7	8	2	14	3	8	5	9	27	16
Chloroform, ether and ethyl chloride	{M. 2 F. 2}	-	-	1	-	-	-	1	-	-	-	-	-	-	-
Chloroform, ether and "stovaine"	F. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Chloroform and "stovaine" .. .. .	F. 1	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Chloroform and cocaine .. .. .	F. 1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
Ether .. .. .	{M. 134 F. 114}	4	20	15	3	4	10	4	2	3	8	10	11	23	17
Ether and ethyl chloride .. .. .	{M. 28 F. 10}	5	7	6	3	-	-	-	-	2	1	1	3	-	-
Ether and "stovaine" .. .. .	F. 1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Ether and atropine .. .. .	F. 1	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Ethyl chloride .. .. .	{M. 3 F. 11}	1	-	1	-	-	-	-	-	1	-	-	-	-	-
A.C.E. mixture .. .. .	M. 10	1	2	-	-	-	-	3	-	1	-	-	1	2	-
Nitrous oxide .. .. .	{M. 21 F. 22}	-	2	-	-	1	2	-	1	2	1	2	1	5	4
"Stovaine" .. .. .	{M. 2 F. 2}	-	-	-	-	-	-	1	-	-	1	-	-	1	-
"Novocaine" .. .. .	{M. 5 F. 4}	-	-	-	1	-	-	-	-	-	-	-	-	-	4
"Novocaine" and "adrenalin" .. .. .	M. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Morphia, atropin and "novocaine"	F. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Cocaine .. .. .	M. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
"Tropocaine" .. .. .	M. 1	-	-	-	-	-	-	1	-	-	-	-	-	-	-
"Tutocaine" .. .. .	F. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
"Spinocaine" and "novocaine"	M. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
"Spinocaine" .. .. .	{M. 2 F. 1}	-	-	-	-	-	-	-	-	-	-	-	-	2	-
"Duracaine" .. .. .	{M. 1 F. 1}	-	-	-	-	1	-	-	-	-	-	-	-	-	1
"Percaine" .. .. .	{M. 7 F. 6}	-	-	-	-	1	1	-	-	1	2	-	-	2	1
"Pantocaine" .. .. .	M. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
"Avertin" .. .. .	{M. 2 F. 3}	-	-	-	-	1	1	-	-	-	-	-	1	1	1
"Avertin" and "percaine" .. .. .	F. 1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
"Novutox" .. .. .	F. 1	-	-	-	-	-	-	-	-	-	-	-	1	-	-
"Nembutal" .. .. .	F. 3	-	-	-	-	-	1	1	-	1	-	-	-	-	-
"Nembutal" and ether .. .. .	F. 1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Kind not stated .. .. .	{M. 7 F. 5}	-	1	1	-	1	-	-	-	-	1	-	2	1	1
Total .. .. .	{M. 413 F. 310}	16	44	36	15	19	25	9	27	12	29	24	27	73	57
		3	24	28	12	6	17	33	27	25	30	20	23	38	24

Table LXII.—England and Wales : Deaths under or associated with Anæsthesia, 1901-31.

Year.	Males.										Females.									
	All ages.	0-	5-	15-	25-	35-	45-	55-	65-	All ages.	0-	5-	15-	25-	35-	45-	55-	65-		
Yearly average :																				
1901-05*	95	14	20	9	13	16	11	7	4	53	6	9	7	11	8	8	3	2		
1906-10*	125	26	20	12	16	18	16	9	8	77	7	14	9	18	11	10	4	3		
1911-15 ..	167	30	23	14	20	28	24	16	10	116	14	17	15	16	22	18	10	5		
1916-20 ..	188	36	25	25	27	22	20	19	13	119	11	16	14	21	22	17	7	9		
1921-25 ..	229	40	28	20	18	27	36	37	24	169	20	17	17	30	29	25	17	12		
1926-30 ..	361	56	47	30	26	37	50	62	53	288	29	29	29	44	51	49	34	23		
1921 ..	204	30	29	16	16	19	34	30	30	133	16	23	16	24	21	19	11	3		
1922 ..	185	29	21	16	9	27	30	35	18	151	16	15	12	29	31	26	12	10		
1923 ..	262	45	37	29	17	38	35	34	27	184	22	23	14	23	32	32	23	15		
1924 ..	245	51	30	21	25	21	42	39	16	184	26	11	30	29	31	21	18	18		
1925 ..	249	43	25	17	23	28	39	45	29	193	22	14	15	43	32	29	23	15		
1926 ..	306	57	43	23	29	34	39	43	38	250	32	22	29	35	44	51	23	14		
1927 ..	328	43	51	25	20	30	42	70	47	268	24	28	29	46	47	40	35	19		
1928 ..	384	63	41	30	23	43	55	67	62	272	29	21	27	44	45	44	33	29		
1929 ..	414	66	61	31	25	43	63	64	61	316	35	25	27	52	50	43	22	22		
1930 ..	375	51	41	39	34	34	52	68	56	332	27	39	33	45	66	58	35	29		
1931 ..	413	60	51	44	36	41	51	73	57	310	27	40	23	60	55	43	38	24		

\* Excluding deaths from cancer and strangulated hernia—see page 95.

Deaths in later periods compared with those of 1911-15 taken as 100.

Yearly average :	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1911-15 ..	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1916-20 ..	113	120	109	179	135	79	83	119	130	103	79	94	93	131	100	94	70	180
1921-25 ..	137	133	122	143	90	96	150	231	240	146	143	100	113	188	132	139	170	240
1926-30 ..	216	187	204	214	130	132	208	388	530	248	207	171	193	275	232	272	340	460
1921 ..	122	100	126	114	80	68	142	188	300	115	114	135	107	150	95	106	110	60
1922 ..	111	97	91	114	45	96	125	219	180	130	114	88	80	181	141	144	120	200
1923 ..	157	150	161	207	85	136	146	213	270	159	157	135	93	144	145	178	230	300
1924 ..	147	170	130	150	125	75	175	244	160	159	186	65	200	181	141	117	180	360
1925 ..	149	143	109	121	115	100	163	281	290	166	157	82	100	269	145	161	230	300
1926 ..	183	190	187	164	145	121	163	269	380	216	229	129	193	219	200	283	230	280
1927 ..	196	143	222	179	100	107	175	438	470	231	171	165	193	288	214	222	350	380
1928 ..	230	210	178	214	115	154	229	419	620	234	207	124	180	275	205	244	330	580
1929 ..	248	220	265	221	125	154	263	400	610	272	250	206	180	325	236	278	430	440
1930 ..	225	170	178	279	170	121	217	425	560	286	193	229	220	281	300	322	350	580
1931 ..	247	200	222	314	180	146	213	456	570	267	193	235	153	375	250	239	380	480

So far as these figures can be taken as any indication of the type of anæsthetic chiefly used, as to which their exclusive association with fatalities makes them an unreliable guide, the increase of deaths under anæsthesia has occurred notwithstanding very general substitution of the safer agent, ether, for the more dangerous chloroform, which was associated with over four-fifths of the deaths at the beginning of the century, but with less than one-seventh in 1931. The increased proportion of fatalities with "other or mixed" anæsthetics is associated with rapidly increasing record of the use of certain agents, especially ethyl chloride, stovaine, and novocaine, which till recently were rarely mentioned on death certificates.

Proportions of deaths, per 10,000 under anæsthetics of stated type, associated with ethyl chloride, alone and in combination,



and with nitrous oxide, stovaine, and novocaine as the only anæsthetic used, have been as follows at the periods stated:—

	Ethyl Chloride,		Nitrous Oxide.	Stovaine.	Novocaine.
	Alone.	In combination.			
1916-20 ..	155	36	146	91	9
1921-25 ..	157	151	308	186	81
1926-30 ..	160	504	500	125	196
1931 ..	197	591	605	56	127

It need scarcely be pointed out that these proportions must 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, and, this being so, it seems possible that the increase of this type of death may be partly dependent upon increase of boldness in operative surgery.

Of the 723 deaths in Table LXII, 560 (77 per cent.) were classed to the 22 headings enumerated in Table LXIII, the

Table LXIII.—England and Wales—Classification of Deaths under or associated with Anæsthesia, 1931.

	Cause to which Death was assigned.	Males.		Females.		Cause to which Death was assigned.	Males.		Females.	
		Males.	Females.	Males.	Females.		Males.	Females.		
24-32	Non-respiratory tuberculosis	8	4	122 b	Intestinal obstruction	16	11			
45-53	Cancer .. ..	55	41	126	Biliary calculi ..	5	6			
66 b	Exophthalmic goitre	2	14	127 (pt.)	Diseases of the gall bladder	2	3			
89 b	Diseases of the mastoid sinus	9	8	136 a	Stricture of the urethra	3	—			
104	Diseases of the nasal fossæ and annexa	8	4	137	Diseases of the prostate.	17	—			
110 : 1	Empyema ..	12	4	138 (pt.)	Circumcision ..	7	—			
115 : 1	Extraction of teeth (pt.)	12	9	54 a	Uterine fibroids	—	7			
115 : 3	Diseases of the tonsils	29	20	140-150	Childbirth and abortion	—	41			
117	Ulcer of the stomach or duodenum	21	3	154	Acute infective osteomyelitis	3	3			
121	Appendicitis ..	37	21	157	Congenital malformations.	10	5			
122 a	Hernia .. ..	40	7	163-198	Violence ..	36	17			

remainder being of very varied causation. The composition of this list changes little from year to year. In 1931, however, the deaths from gastric and duodenal ulcer fell to 24, against 34, 29 and 45 in the three preceding years, whilst deaths from exophthalmic goitre increased further to 16 against 7, 6 and 15.

The proportion of the deaths reported from different classes of institutions, etc., in various sections of the country, is stated in the following table, 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, the registration counties of former Annual Reports being grouped in accordance with the new regional classification.

During 1925-31 the proportion of hospital deaths has varied only from 80 per cent. of the total in 1926 to 76 in 1930 and 1931, 73 in 1929 and 72 in each of the other three years; for poor-law institutions the percentage has been 8-14 in different years; for mental hospitals never over 1; for nursing homes, 4-7; and for non-institutional deaths, 5-10.

Table LXIV.—Deaths under Anæsthetics Registered in 1931. Distribution by Part of Country and Place of Occurrence.

		Hospitals.	Poor Law Institutions.	Mental Hospitals.	Nursing Homes.	Elsewhere.	Total.
England and Wales	{ M.	321	62	1	14	15	413
	{ F.	230	37	1	18	24	310
Greater London	{ M.	97	27	1	1	3	129
	{ F.	64	25	—	3	5	97
South-East excluding Greater London	{ M.	34	4	—	4	5	47
	{ F.	29	—	—	1	6	36
North I	{ M.	19	—	—	—	—	19
	{ F.	11	—	—	—	1	12
.. II	{ M.	6	2	—	1	1	10
	{ F.	5	1	—	2	1	9
.. III	{ M.	29	6	—	1	1	37
	{ F.	19	1	1	3	—	24
.. IV	{ M.	42	8	—	1	2	53
	{ F.	41	6	—	2	—	49
Midland I	{ M.	38	10	—	3	—	51
	{ F.	27	3	—	3	—	38
.. II	{ M.	15	—	—	2	1	18
	{ F.	12	—	—	—	—	12
East ..	{ M.	13	—	—	—	—	13
	{ F.	7	1	—	1	1	10
South-West	{ M.	12	—	—	—	1	13
	{ F.	6	—	—	1	2	9
Wales I	{ M.	13	5	—	1	1	20
	{ F.	7	—	—	2	2	11
.. II	{ M.	3	—	—	—	—	3
	{ F.	2	—	—	—	1	3
Greater London	{ Admin. M.	72	18	—	1	3	94
	{ County F.	56	20	—	2	4	82
	{ Outer M.	25	9	1	—	—	35
	{ Ring F.	8	5	—	1	1	15



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, 28 to each million (40 in London itself, and 13 in the Outer Ring), and lowest in Wales II and the South-West region, where the ratios are respectively 9 and 11 to each million. In other regions the ratio ranges from 13 to 20.

**Status Lymphaticus and Anæsthetics.**—The deaths from status lymphaticus primarily classified to diseases of the thymus in Table 21, which have shown a tendency to increase in recent years and reached a maximum of 202 in 1929, fell somewhat precipitately to 138 in 1930, and numbered 143 in 1931. In addition to these 143 deaths, there were 37 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 ..	22	8	7	1	5	—	1	—
Females ..	15	4	5	2	—	2	1	1

#### SEASONAL DISTRIBUTION OF MORTALITY.

In Table LX of the Review for 1925, the average numbers of deaths per day from the more important causes in England and Wales during the quinquennium 1921–25 were shown for each month of the year, and the mean seasonal trend of mortality during that period was examined in detail. In discussing the adequacy of a five-year period for arriving at general conclusions as to the form of the seasonal curves, it was remarked that “ we are faced by the dilemma that a short exposure is required to register the changing conditions, but a long exposure to eliminate chance variations.”

The most important factors responsible for year to year variations affecting mortality from many causes to an appreciable extent are, under present conditions, the occurrence or non-occurrence of influenza epidemics and the severity of the winter. Recent experience of the influence of these factors would lead us to expect that, although a period of five years will generally suffice to smooth out the effect of the climatic variations alone upon mortality, quinquennial monthly rates for many causes of death may be considerably influenced by the inclusion of such a year as 1929, which was marked by an unusually severe influenza epidemic combined with rigorous weather conditions in February and March. This expectation is realised when a comparison of

the mean seasonal curves of mortality in 1926–30 and 1921–25 is made. It may be noted that the mean daily air temperature at Greenwich in the March quarters of 1921–25 was 42·5° F., and of 1926–30 it was 41·8° F.

On the other hand, such a comparison of quinquennial averages of daily deaths in each month, from which most of the “ chance variations ” are largely eliminated, will serve to show whether the downward or upward trend of mortality from certain causes is more pronounced in one season of the year than another, and in Table LXV the material for 1926–30 has, therefore, been presented in precisely the same form as in Table LX of the Review for 1925, which related to the period 1921–25. It is only possible in this Review to draw attention to a few of the most evident differences, leaving a more detailed examination of monthly mortality on a different basis to be made in future Reviews.

Considering all causes together, the percentage changes in mean daily mortality registered in 1926–30 in excess or defect of the same rates for the previous quinquennium were as follows: January +2, February +13, March +8, April –4, May +1, June +2, July +1, August +1, September –1, October +6, November –4, December –4. This suggests some unfavourable factor in the second period operative in February, and to a slighter extent in March and October.

Influenza mortality was maximal in February in each period, but in 1926–30 the peak was much sharper, the mean daily deaths being 41 per cent. higher than in 1921–25 for February and March, but lower over most of the remaining months. The reason for this was that in the epidemic years 1922 and 1924 the maxima occurred in January and March respectively, whilst in 1927 the peak occurred in February and in 1929 the maximal mortality was shared almost equally by February and March.

A similar relative concentration of deaths into these two months is also seen when the 1926–30 figures are compared with 1921–25 for measles, whooping cough, respiratory tuberculosis and pneumonia. The seasonal curve for measles mortality, which reached its peak in April for the preceding period, showed a March maximum for 1926–30. This backward movement of the modal month has been in progress since 1921, when the maximum occurred in May; in the next six years it varied between April and March, and in the next three occurred in March; in 1931 it occurred in February. Partly as a result of this movement of the mode, measles mortality was higher in February and March in the second quinquennium, but lower in every other month. Whooping cough mortality, probably influenced by influenza to some extent, showed practically no change in mean rate for the



maximal months of February and March, but there was a substantial decline in every other month, varying from 21 per cent. in April to 46 per cent. in November.

Respiratory tuberculosis showed no change for March, and a fall of only 4 per cent. for February, but a larger relative decline for every other month. As might be expected, broncho-pneumonia reflects most clearly the effect of the particular seasonal configuration of influenza in 1926-30, an increase in mortality over the preceding quinquennium being registered for February and March, amounting to 14 per cent. in the latter month, whilst for every other month there was a decrease. Lobar pneumonia, with higher mortality in 1926-30 for every month except November and December, also showed the greatest relative increase in February, amounting to 41 per cent. contrasted with 16 per cent. for the whole year. Bronchitis showed a decrease in every month except February, the relative decline being greatest in November and December. For diseases of the respiratory system as a whole, there was a 9 per cent. increase for February contrasted with a decrease for every other month, this being as great as 31 per cent. for November and 30 per cent. for December.

Notifications of encephalitis lethargica were also at a maximum for February, instead of May as in 1921-25.

Heart diseases as a whole showed an increase for every month, the percentage rates of excess in 1926-30 over the preceding quinquennium being, in descending order, as follows: February 53; January 44; March 43; October 39; May 34; June 33; July and August 32; December 31; April 29; September 27; November 26. It was shown in the Review for 1925 that for a considerable number of diseases, notably diabetes, cerebral hæmorrhage and softening, aortic valve disease, angina pectoris, myocardial disease (not fatty), arterio-sclerosis, hernia, lobar pneumonia, cellulitis, disseminated sclerosis, and rheumatoid or osteo-arthritis, there was in 1921-25 a double winter maximum of mortality, the first in December and the second in February, or in a few instances in March or April. Table LXV shows that the first December peak was absent in 1926-30 for every one of these diseases except angina pectoris. A single February maximum was apparent for diabetes, cerebral hæmorrhage and softening, myocardial disease (not fatty), arterio-sclerosis, and lobar pneumonia, and a January maximum for aortic valve disease. Hernia, disseminated sclerosis and rheumatoid or osteo-arthritis showed double maxima in January and March, and cellulitis in November and January-February. It would thus appear that the prevalence of the bimodal seasonal curve with its January notch, so noticeable in the diagrams for 1921-25, was the result of some combination of factors, which was not a permanent feature.

Diarrhœa and enteritis registered a fall in every month, this being relatively greatest, 59 per cent., in August, compared with

31 per cent. for the year as a whole. Rickets showed an improvement in every month except November, the fall being relatively greater during the months April to August than for the rest of the year. Diphtheria incidence, as shown by notifications for 1926-30, was highest in November, and mortality was highest in February, whereas both were maximal in January for 1921-25.

Table LXV.—England and Wales, 1926-1930: Average Number of Deaths per day from certain causes during each Month of the year and, in the case of certain Notifiable Diseases, the average Number of Notifications per day (*the figures relating to Notifications being shown in italics*).

Cause (with International List No.).	1926- 1930.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
All Causes .. ..	1,307	1,605	1,851	1,696	1,380	1,235	1,096	1,037	1,008	1,018	1,149	1,238	1,402
Causes other than Diseases of the Respi- ratory System	1,122	1,296	1,460	1,375	1,172	1,077	983	949	931	938	1,026	1,083	1,188
1-25 Epidemic Diseases ..	80.6	108	220	194	101	67.0	44.3	34.7	30.8	29.6	39.8	47.5	60.5
Epidemic Diseases other than Influenza	40.6	50.3	64.8	68.6	57.0	44.2	32.7	27.9	25.1	23.6	25.6	30.2	39.2
1 (a) Typhoid fever ..	0.85	0.75	0.63	0.72	0.63	0.75	0.83	0.83	0.95	1.07	1.06	1.11	0.89
	<i>6.47</i>	<i>4.19</i>	<i>4.21</i>	<i>4.86</i>	<i>5.79</i>	<i>5.91</i>	<i>6.42</i>	<i>7.44</i>	<i>9.13</i>	<i>10.4</i>	<i>8.38</i>	<i>6.09</i>	<i>4.39</i>
7 Measles .. ..	10.4	12.6	17.1	22.8	19.3	14.0	9.29	6.16	4.25	2.33	2.92	5.34	9.01
8 Scarlet fever .. ..	1.80	2.18	2.55	2.34	1.87	1.94	1.53	1.25	1.19	2.10	1.57	1.77	2.31
	<i>274</i>	<i>311</i>	<i>276</i>	<i>259</i>	<i>236</i>	<i>240</i>	<i>227</i>	<i>236</i>	<i>203</i>	<i>265</i>	<i>363</i>	<i>361</i>	<i>310</i>
9 Whooping cough ..	10.5	13.4	22.5	22.0	15.8	11.3	7.58	6.53	5.66	5.72	4.45	4.38	7.33
10 Diphtheria .. ..	8.69	11.7	12.0	10.2	9.14	7.10	5.97	6.15	6.05	6.67	8.72	9.25	11.5
	<i>165</i>	<i>198</i>	<i>191</i>	<i>173</i>	<i>146</i>	<i>138</i>	<i>129</i>	<i>135</i>	<i>116</i>	<i>156</i>	<i>196</i>	<i>209</i>	<i>197</i>
11 Influenza .. ..	40.0	57.5	155	126	43.9	22.8	11.6	6.78	5.66	6.09	14.2	17.4	21.3
21 Erysipelas .. ..	2.51	3.56	3.26	3.23	3.19	2.82	1.98	1.69	1.62	1.41	1.94	2.71	2.81
	<i>44.7</i>	<i>57.3</i>	<i>51.3</i>	<i>47.6</i>	<i>45.5</i>	<i>42.0</i>	<i>36.7</i>	<i>33.0</i>	<i>33.8</i>	<i>36.0</i>	<i>47.4</i>	<i>56.1</i>	<i>50.9</i>
22 Acute poliomyelitis ..	0.486	0.413	0.390	0.394	0.353	0.348	0.347	0.374	0.581	0.773	0.806	0.567	0.484
	<i>2.17</i>	<i>1.31</i>	<i>1.36</i>	<i>0.994</i>	<i>0.893</i>	<i>0.817</i>	<i>0.857</i>	<i>1.82</i>	<i>3.30</i>	<i>4.78</i>	<i>4.85</i>	<i>3.04</i>	<i>1.67</i>
23 Encephalitis lethargica	3.01	3.24	3.65	3.58	3.49	3.19	2.98	2.70	2.66	2.41	2.52	2.93	2.85
	<i>3.82</i>	<i>4.26</i>	<i>4.64</i>	<i>4.33</i>	<i>4.31</i>	<i>3.99</i>	<i>4.15</i>	<i>3.81</i>	<i>3.39</i>	<i>3.15</i>	<i>3.16</i>	<i>3.46</i>	<i>3.29</i>
24 Meningococcal meningitis	1.34	1.21	1.63	1.92	1.78	1.68	1.21	1.34	1.19	1.03	0.83	1.21	1.10
	<i>1.43</i>	<i>1.35</i>	<i>1.77</i>	<i>1.91</i>	<i>1.78</i>	<i>1.90</i>	<i>1.40</i>	<i>1.34</i>	<i>1.20</i>	<i>1.09</i>	<i>0.989</i>	<i>1.28</i>	<i>1.21</i>
29 Tetanus .. ..	0.408	0.368	0.348	0.426	0.433	0.471	0.493	0.477	0.503	0.407	0.361	0.313	0.290
Tuberculosis.—													
31 Respiratory system ..	83.2	93.6	103	100	92.6	85.2	78.7	72.2	67.4	68.3	75.0	77.8	85.1
32 Nervous system .. ..	7.28	6.84	7.88	8.83	8.88	9.10	8.69	7.29	6.59	5.89	5.56	5.65	6.19
33 Intestines and peri- toneum	3.61	3.63	3.95	4.37	4.08	3.92	3.47	3.56	3.25	3.30	3.36	3.33	3.18
38 Syphilis .. ..	3.83	4.15	4.21	4.30	4.00	3.57	3.37	3.37	3.25	3.31	4.05	3.92	4.52
41 Septicæmia .. ..	2.07	2.34	2.34	2.51	2.25	2.22	1.80	1.66	1.74	1.44	1.93	2.29	2.37
43-49 Cancer .. ..	152	154	156	152	150	151	149	151	151	151	155	155	154
Tumours not returned as malignant	2.25	2.34	2.33	2.27	2.17	2.23	2.19	2.40	2.06	2.15	2.31	2.21	2.39
50 Rheumatic fever ..	4.25	5.24	4.94	5.08	4.68	4.43	3.91	3.46	3.43	3.76	3.41	4.03	4.66
52 (2) Rheumatoid and osteo- arthritis	7.29	8.97	8.91	9.26	7.42	6.60	5.66	6.09	5.90	6.16	6.86	7.57	8.17
56 Rickets .. ..	1.11	1.40	1.58	1.61	1.41	1.17	0.747	0.897	0.690	0.927	0.862	1.03	0.994
57 Diabetes .. ..	14.2	16.7	17.5	15.8	14.2	13.3	11.8	11.7	12.3	12.1	14.4	15.0	15.9
58 (a) Pernicious anæmia ..	6.24	6.70	6.81	6.54	6.77	5.97	6.01	5.57	5.81	5.80	6.36	6.43	6.21
60 (a) Exophthalmic goitre ..	2.80	2.89	2.94	2.99	2.51	2.79	2.62	2.74	2.65	2.69	2.62	3.07	3.12
65 (a) Leukæmia .. ..	1.76	1.88	2.04	1.70	1.67	1.68	1.71	1.71	1.68	1.67	1.92	1.69	1.76
65 (b) Lymphadenoma ..	1.26	1.39	1.29	1.35	1.15	1.21	1.31	1.25	1.25	1.15	1.29	1.16	1.35
70-86 Diseases of the nervous system	119	143	147	139	125	117	108	99.0	98.0	96.5	108	116	131
71 Meningitis .. ..	3.67	4.03	4.17	4.53	4.39	4.04	4.01	3.28	3.19	2.89	3.13	3.23	3.19
72 Tabes dorsalis .. ..	2.13	2.46	2.83	2.34	2.34	2.19	1.75	1.63	1.92	1.84	2.00	2.07	2.23
74 Cerebral hæmorrhage, apoplexy, etc.	68.7	84.5	86.1	79.7	72.7	67.0	62.0	55.3	54.7	55.0	63.4	68.6	76.9
76 General paralysis of the insane	3.71	4.50	4.52	4.26	3.73	3.57	2.88	3.25	2.99	3.18	3.65	3.62	4.37
78 Epilepsy .. ..	5.93	6.35	7.13	6.97	6.37	6.18	5.67	5.27	5.23	4.97	4.83	5.59	6.68
79-80 Convulsions .. ..	5.96	7.76	8.24	7.85	6.66	6.27	5.27	4.57	4.64	4.96	4.78	4.77	5.94
83 Cerebral softening ..	1.19	1.64	1.65	1.58	1.21	1.06	0.880	0.948	0.948	0.853	0.942	1.14	1.43
84 (2) Cerebral tumour ..	3.30	2.97	3.46	3.37	3.33	3.19	3.28	3.28	3.43	3.23	3.39	3.27	3.45
84 (3) Disseminated sclerosis..	2.20	2.55	2.48	2.66	2.07	2.32	1.91	1.91	1.97	1.91	2.21	2.15	2.23
84 (4) Paralysis agitans ..	3.08	3.79	3.54	3.45	3.05	3.06	2.57	2.82	2.76	2.57	2.86	2.97	3.57
86 Diseases of the ear and mastoid sinus	3.62	3.83	3.99	4.29	3.97	3.81	3.57	3.23	3.04	2.85	3.41	3.62	3.91
87-90 Heart disease .. ..	219	270	294	268	226	205	183	174	171	170	200	221	254
87 Pericarditis .. ..	0.788	0.968	1.21	0.871	0.853	0.826	0.700	0.561	0.658	0.680	0.684	0.667	0.806
88 (1) Infective endocarditis..	2.75	2.79	2.94	2.73	2.75	2.72	2.98	2.46	2.72	2.79	2.76	2.73	2.63
89 Angina pectoris .. ..	10.5	11.0	10.3	10.9	10.5	10.1	9.17	8.73	8.73	9.31	10.9	12.2	13.6



Table LXV.—England and Wales, 1926–1930 : Average Number of Deaths per day from certain causes during each Month of the year and, in the case of certain Notifiable Diseases, the average Number of Notifications per day (*the figures relating to Notifications being shown in italics*)—continued.

Cause (with International List No.)	1926- 1930.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
90 (1-4) Valvular disease ..	72.4	86.7	93.7	83.3	75.0	68.7	62.9	61.3	58.7	58.8	66.9	73.5	80.5
90 (1) Aortic valve disease ..	9.00	10.9	10.8	9.64	9.11	8.67	8.03	7.96	7.57	7.41	8.68	9.31	9.97
90 (2) Mitral valve disease ..	27.5	33.0	35.8	31.8	28.9	25.4	23.8	23.0	22.2	22.8	25.5	27.5	31.1
90 (5) Fatty heart ..	7.95	10.0	9.77	9.11	7.79	7.50	6.37	6.27	6.81	6.83	7.41	8.21	9.38
90 (7) Other myocardial disease	95.1	119	134	123	97.8	86.9	75.6	71.8	70.8	69.9	84.7	95.2	114
91 (a) Aneurysm ..	3.27	3.49	3.82	3.75	3.25	3.06	2.75	2.61	3.08	2.96	3.26	3.63	3.57
91 (b) Arterio sclerosis ..	58.7	71.3	74.3	68.5	59.3	55.3	48.7	49.8	47.7	47.2	54.5	60.8	68.2
91 (b)1 Arterio sclerosis with cerebral vascular lesion	25.5	28.6	29.0	26.8	24.5	23.0	21.7	23.5	22.6	22.0	25.2	28.7	30.2
91 (b)2 Arterio sclerosis without record of cerebral vascular lesion	33.3	42.8	45.3	41.7	34.9	32.2	26.9	26.3	25.1	25.2	29.3	32.1	38.0
97-107 Diseases of the respiratory system	185	309	390	321	208	158	114	88.0	76.9	80.5	123	155	213
99 Bronchitis ..	76.4	139	176	138	83.8	58.8	39.5	30.1	26.1	29.5	47.6	63.4	91.0
99 (a) Acute ..	18.8	38.1	50.4	35.8	19.8	12.9	7.57	4.87	4.03	5.09	10.6	15.4	22.8
99 (b) Chronic ..	25.8	42.8	51.6	42.3	28.0	21.8	16.2	13.3	11.6	12.4	17.8	22.6	31.3
100 Broncho pneumonia ..	50.1	82.9	117	96.6	55.5	39.6	27.5	21.1	19.3	19.4	29.3	38.8	58.2
101 (a) Lobar pneumonia ..	29.4	41.9	45.2	42.6	34.9	31.2	24.5	19.6	15.6	16.3	24.2	26.7	31.6
101 (b) Pneumonia (not otherwise described)	14.7	23.2	27.7	23.5	18.2	14.8	11.2	8.08	6.71	6.51	10.4	12.2	15.0
102 (1) Empyema ..	1.13	1.38	1.38	1.42	1.26	1.39	1.12	0.88	1.05	0.83	0.92	0.95	1.05
102 (2) Other pleurisy ..	1.98	2.65	2.42	2.29	2.27	2.17	1.95	1.41	1.51	1.35	1.72	1.89	2.12
105 Asthma ..	5.54	9.90	11.8	8.48	5.65	4.15	2.97	2.66	2.56	2.38	4.08	5.04	7.19
108-127 Diseases of the digestive system	73.4	76.8	71.8	72.7	69.8	68.3	66.0	67.7	71.6	83.7	81.1	74.4	76.8
111 Ulcer of the stomach or duodenum	10.8	12.3	11.4	11.2	10.8	10.4	10.5	10.5	9.46	9.53	10.0	10.7	12.9
111 (a) Ulcer of the stomach ..	7.52	8.77	7.92	7.78	7.46	7.00	7.09	7.09	6.52	6.84	7.06	7.65	9.09
111 (b) Ulcer of the duodenum	3.30	3.55	3.46	3.41	3.35	3.42	3.45	3.43	2.95	2.69	2.97	3.10	3.86
112 (1) Gastritis ..	3.65	4.57	3.94	3.80	3.67	3.53	3.59	3.21	3.37	3.47	3.42	3.29	3.94
113-114 Diarrhoea and enteritis	18.4	16.5	15.1	14.7	14.2	13.9	13.7	16.1	20.2	32.2	28.3	19.1	17.1
117 Appendicitis ..	7.72	7.91	7.27	8.07	7.97	7.86	7.63	7.48	7.73	7.77	7.59	7.81	7.57
118 (a) Hernia ..	5.35	6.25	6.08	6.15	5.35	5.09	4.79	4.65	4.75	4.98	4.95	5.43	5.80
118 (b) Intestinal obstruction ..	6.98	7.75	7.06	7.55	6.81	6.88	6.58	6.61	6.86	6.80	6.57	6.62	7.59
122 Cirrhosis of the liver ..	4.95	5.61	5.17	5.19	4.85	5.02	4.53	4.32	4.48	4.70	5.14	5.19	5.26
123 Biliary calculi ..	3.24	3.39	3.35	3.33	3.31	3.39	2.98	3.02	2.99	3.16	3.12	3.35	3.45
128 Acute nephritis ..	3.41	4.34	4.36	4.00	4.06	3.57	3.15	2.50	2.63	2.69	2.88	3.51	3.35
129 Chronic nephritis ..	36.4	41.6	43.1	39.9	37.9	36.0	32.7	31.3	31.2	30.9	34.4	37.0	40.8
133 (1) Cystitis ..	2.45	2.64	2.76	2.81	2.46	2.32	2.48	2.31	2.10	2.23	2.30	2.40	2.56
135 Diseases of the prostate	9.23	10.0	9.77	9.38	8.67	8.23	7.79	8.32	8.92	8.71	10.2	10.4	10.4
137 & 139 Non-malignant tumours of the ovaries and uterus	1.95	1.94	2.15	2.05	1.98	1.89	1.76	1.85	1.90	1.87	2.02	2.16	1.85
143-150 The puerperal state ..	7.73	8.22	7.91	8.47	8.25	8.04	7.29	7.48	7.38	7.23	7.11	7.40	7.93
144 Puerperal hæmorrhage	0.909	0.935	0.879	1.12	0.947	0.839	0.833	0.929	0.884	1.01	0.761	0.780	0.987
145 Other accidents of child-birth	0.846	0.806	0.766	0.839	0.927	0.968	0.880	0.832	0.897	0.873	0.774	0.787	0.794
146 Puerperal sepsis ..	3.13	3.57	3.72	3.50	3.36	3.55	2.71	2.66	2.72	2.54	2.73	3.06	3.47
147 Phlegmasia alba dolens, etc.	0.528	0.594	0.482	0.613	0.640	0.490	0.527	0.613	0.406	0.400	0.535	0.527	0.510
148 Puerperal albuminuria	1.43	1.45	1.28	1.46	1.56	1.40	1.52	1.55	1.58	1.43	1.32	1.27	1.32
151 (1) Senile gangrene ..	2.60	3.21	3.21	3.34	3.13	2.97	2.61	2.17	2.08	2.09	2.10	2.09	2.27
152 Carbuncle, boil ..	1.22	1.48	1.10	1.30	1.11	1.12	1.12	1.11	1.19	1.16	1.30	1.39	1.22
153 (1) Cellulitis ..	1.50	1.97	1.97	1.85	1.75	1.48	1.35	0.94	0.97	1.26	1.17	1.66	1.61
155 (1) Infective osteomyelitis	1.32	1.45	1.38	1.52	1.28	1.30	1.27	1.19	1.15	1.39	1.26	1.15	1.46
160 (1) Congenital debility ..	7.51	9.61	9.48	9.34	8.35	7.29	6.34	5.63	5.58	6.32	7.04	7.09	8.15
161 (1) Premature birth ..	32.5	37.0	39.2	37.9	33.9	31.1	28.8	27.8	27.3	27.9	29.6	32.2	37.2
162 (2) Atelectasis ..	2.84	2.97	3.16	3.34	3.04	2.98	2.79	2.92	2.50	2.21	2.62	2.63	2.90
164 Old age ..	P. 58.2	76.7	84.2	74.7	62.2	54.7	47.7	44.1	41.8	42.8	50.0	55.5	65.7
	M. 23.5	30.9	34.5	29.1	24.5	22.0	19.2	17.5	16.9	17.7	20.2	23.1	27.4
	F. 34.7	45.8	49.7	45.5	37.7	32.6	28.5	26.6	24.9	25.1	29.8	32.4	38.4
	P. 13.3	12.5	12.7	14.2	14.5	14.5	14.4	13.1	13.3	12.4	11.5	12.1	
165-174 Suicide (all forms)	M. 9.30	9.06	8.94	9.97	10.3	10.1	10.1	9.87	9.18	9.21	8.54	7.97	8.34
	F. 4.00	3.40	3.77	4.22	4.20	4.43	4.38	4.50	3.89	4.06	3.88	3.50	3.74
169 Suicide by drowning ..	2.50	2.38	2.51	2.87	2.67	2.75	2.79	2.70	2.55	2.29	2.28	2.04	2.21
179 Accidental burns (Conflagration excepted)	P. 3.98	5.50	6.28	5.05	3.92	3.06	2.79	2.66	2.65	2.81	3.51	4.33	5.37
	M. 1.75	2.37	2.55	1.99	1.69	1.41	1.29	1.30	1.33	1.27	1.70	1.98	2.15
	F. 2.23	3.12	3.73	3.05	2.23	1.65	1.50	1.35	1.32	1.55	1.81	2.35	3.23
182 Accidental drowning ..	P. 4.19	3.24	3.21	3.35	3.64	4.38	5.25	7.39	6.54	4.32	3.03	2.85	2.95
	M. 9.21	11.4	11.2	9.81	8.77	8.11	7.92	7.97	8.41	7.93	8.71	9.31	11.0
	F. 4.61	5.43	5.48	4.76	4.43	4.06	4.15	4.26	4.37	4.24	4.35	4.37	5.41
185 Accidental fall ..	P. 4.60	5.98	5.72	5.05	4.33	4.05	3.77	3.71	4.03	3.69	4.36	4.95	5.63
	M. 17.7	14.2	13.7	14.7	16.6	18.2	18.6	20.1	20.7	20.3	19.2	19.0	17.2
188 Other crushing (mainly Motors)													

P. = Persons. M. = Males. F. = Females.

### MEDICAL CERTIFICATION

Reference may be made to the section under this head in the corresponding volume of the Statistical Review for 1928, as indicating the circumstances in which it has been arranged to include statistics on this subject as a regular annual feature of the Review. As stated therein, the figures for 1928 were given with a special degree of elaboration intended to serve as a datum line for similarly exhaustive comparisons on periodical occasions in the future; and for the present and other intermediate years less detail is given. It will be borne in mind 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.

In Table LXVI figures are given bearing upon 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 LXVI.—Summary of Certification of Deaths Registered During the Year 1931.

	Registered Medical Practitioner.	Inquest or Coroner's P.M. without Inquest.	Other cases reviewed by Coroner.*	Total deaths registered.	
				Number.	Percentage.
Seen after death ..	210,814	38,767	4,855	254,436	51.8
Not seen after death	235,985	—	—	235,985	48.0
No statement ..	1,209	—	—	1,209	0.2
	448,008	38,767	4,855	491,630	100.0

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

The above statement shows that in 1931 the proportion of "seen" cases was 51.8 per cent. of the total deaths registered; in 1928, 1929 and 1930 the corresponding percentages were 51.0, 49.7 and 52.0.

The number of certificates without indication of whether the body was seen or not seen after death has steadily declined from 2,108 in 1928 to 1,209 in 1931; it tends to confirm the supposition that this is a temporary feature mainly due to the inception of the new procedure.



In the cases returned above as "not seen" the great majority of the deceased persons were, of course, seen alive by the medical attendant on the day of death or on the day before. Figures have not been extracted since 1928 but for that year it was stated that "if these cases, totalling to 41 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 92 per cent. Further, if those 'seen alive' within two days are added, the total is increased to 96 per cent."

Of the 48.0 per cent., or 235,985 deaths in all, included above as "not seen" after death, a substantial proportion, viz., 73,658, took place in hospitals and other residential institutions.

As the field for any enlargement of the proportion of cases "seen" after death is limited to the cases of deaths certified by medical practitioners it will be of interest to analyse such cases in more detail.

Variations in the proportions of "seen" and "not seen" cases during the years 1928 to 1931 are shown in Table LXVII.

Table LXVII.—Comparison of Proportions of "seen" and "not seen" in Institutions and in Private Practice (Coroners' Cases Excluded). 1928-31.

		Public Assistance Institutions.		Voluntary Hospitals.		Private Practice.	
		Seen.	Not Seen.	Seen.	Not Seen.	Seen.	Not Seen.
		%	%	%	%	%	%
March Quarter	1928	35.3	64.7	70.2	29.8	42.8	57.2
	1929	32.0	68.0	69.8	30.2	41.6	58.4
	1930	34.4	65.6	69.6	30.4	43.3	56.7
	1931	33.4	66.6	69.5	30.5	44.1	55.9
June Quarter	1928	36.7	63.3	69.7	30.3	41.6	58.4
	1929	35.8	64.2	70.0	30.0	41.0	59.0
	1930	34.6	65.4	69.4	30.6	43.2	56.8
	1931	34.6	65.4	70.3	29.7	43.4	56.6
September Quarter	1928	37.1	62.9	69.9	30.1	42.3	57.7
	1929	36.2	63.8	69.4	30.6	42.1	57.9
	1930	34.5	65.5	71.0	29.0	44.1	55.9
	1931	35.6	64.4	71.2	28.8	44.0	56.0
December Quarter	1928	36.7	63.3	69.6	30.4	44.0	56.0
	1929	35.3	64.7	69.9	30.1	43.9	56.1
	1930	35.6	64.4	71.4	28.6	45.5	54.5
	1931	35.7	64.3	70.7	29.3	45.7	54.3
Year	1928	36.4	63.6	69.8	30.2	42.7	57.3
	1929	34.2	65.8	69.8	30.2	42.0	58.0
	1930	34.8	65.2	70.3	29.7	44.0	56.0
	1931	34.6	65.4	70.4	29.6	44.3	55.7

Note.—The statutory notice of death respecting all deaths in Mental Institutions provides for a statement of marks of violence found on the body; and in view of this provision all deaths in these Institutions have been classed as "seen" after death.

## POPULATION

Now that County Census Reports have been compiled and published for all counties in England and Wales, it is possible to announce that the total population enumerated in the Country on the 26th April, 1931, numbered 39,952,377 persons, of whom 19,133,010 were males and 20,819,367 were females. The total is 4,446 in excess of the provisional figure published in the Preliminary Census Report and referred to in last year's Statistical Review, and though the difference is somewhat greater than the corresponding difference between the preliminary and final census figures of 1921, it is not material in relation to the total population, and is insufficient to disturb the 1930 estimate of population which was constructed on the basis of the provisional census figures.

It may be recalled that, in the Statistical Review of last year (1930), attention was drawn to the closeness of the agreement between the realised census figure and the forecast derived from the intercensal estimation procedure. It was decided thereon to regard the national estimates published in the successive Reviews from 1922 onwards as having been substantially confirmed by the 1931 return, there being no obvious method with the aid of the mid-1931 totals of obtaining intercensal interpolations between 1921 and 1931 of demonstrably greater validity.

The final 1931 census figures were not available when Parts I and II of the present Review were prepared, and the adopted mid-year estimates of population for 1931 shown in those volumes and used in the calculation of the published birth and death-rates, etc., were accordingly derived from the provisional census figures by making appropriate allowance for births, deaths and migration in respect of the 65 days between the Census date (26th April) and the 30th June.

The figures arrived at in this way and adopted as the mid-1931 estimates were as follows:—persons, 39,988,000; males, 19,160,000; females, 20,828,000; all of them sufficiently close to the enumerated census figures not to require further justification.

**Age Distribution.**—The estimated sex and age distribution of the national population is for this and future years to be published in Part I of the Review, and the appropriate figures for 1931 will be found in Table 1 of Part I. The 1931 Census material was not available when the table was prepared and in its absence the figures had to be estimated from the corresponding 1930 distribution by the survivorship method used in recent years; this briefly consists of (1) obtaining the year's deaths arising from the population at each age in 1930, and treating the survivors as the population at the next higher age in 1931, (2) completing the table by the addition of the population aged 0-1, represented by the survivors at the middle of 1931 of the births occurring between the middle of 1930 and the middle of 1931, and (3) adjusting the



results of these two operations in respect of the balance of population movement (mainly migration) in accordance with such age statistics as are available in respect thereof.

Since the publication of the earlier parts of the 1931 Review, the 1931 Census age distribution has become available. This, naturally, could not be used for the age-rates and standardised rates published in Parts I or II, but it has been found possible to utilize it for the Text volume and the opportunity may, therefore, be taken of setting out the new age distribution side by side with the corresponding figures derived by survivorship from the previous 1921 Census.

Table LXVIII.—England and Wales.—Estimated Age Distribution of the Population—Mid-1931.

Age.	Estimated Age Distribution derived from 1931 Census.*			Estimated Age Distribution derived from 1921 Census and published in Table I of Part I.		
	Persons.	Males.	Females.	Persons.	Males.	Females.
Col 1	2	3	4	5	6	7
All ages ..	39,988,000	19,160,000	20,828,000	39,988,000	19,160,000	20,828,000
0— ..	610,600	310,000	300,600	610,650	310,070	300,580
1— ..	596,200	300,600	295,600	596,170	300,560	295,610
2— ..	595,200	301,000	294,200	595,200	300,980	294,220
3— ..	591,500	298,800	292,700	591,510	298,820	292,690
4— ..	611,100	308,000	303,100	611,070	307,970	303,100
0— ..	3,004,600	1,518,400	1,486,200	3,004,600	1,518,400	1,486,200
5— ..	3,299,700	1,666,500	1,633,200	3,318,600	1,675,800	1,642,800
10— ..	3,225,400	1,630,500	1,594,900	3,214,300	1,623,500	1,590,800
15— ..	3,416,500	1,702,200	1,714,300	3,435,900	1,722,200	1,713,700
20— ..	3,491,100	1,699,500	1,791,600	3,555,300	1,781,500	1,773,800
25— ..	3,364,300	1,634,600	1,729,700	3,370,500	1,656,900	1,713,600
30— ..	3,061,700	1,438,300	1,623,400	3,008,300	1,378,200	1,630,100
35— ..	2,805,400	1,284,300	1,521,100	2,822,000	1,274,800	1,547,200
40— ..	2,665,900	1,230,600	1,435,300	2,649,900	1,205,800	1,444,100
45— ..	2,553,200	1,185,900	1,367,300	2,561,800	1,176,200	1,385,600
50— ..	2,381,100	1,115,800	1,265,300	2,375,100	1,100,800	1,274,300
55— ..	2,075,900	990,900	1,085,000	2,129,800	1,011,200	1,118,600
60— ..	1,663,000	780,800	882,200	1,685,600	791,300	894,300
65— ..	1,276,200	580,900	695,300	1,232,600	566,000	666,600
70— ..	874,600	378,400	496,200	822,700	360,900	461,800
75— ..	503,800	206,100	297,700	493,600	206,100	287,500
80— ..	227,500	84,400	143,100	216,200	79,200	137,000
85 and up	98,100	31,900	66,200	91,200	31,200	60,000

\* At ages under 5 the figures are not derived from Census returns but from the births and relevant deaths of the preceding five years.

With regard to the new figures shown in cols. 2-4 of the foregoing table, it should be observed that certain modifications have been made to the enumerated census figures of 1931. In the first place they purport to represent the position as at the middle of the year, and allowance has been made therefore for the slight increment which may be assumed to have taken place since the 26th April, the date of the Census. Secondly, at ages under 5, the children enumerated proved to be some 14,303 below the numbers expected from a consideration of the births and relevant deaths during the five years preceding the Census, and as it has been customary at previous censuses to regard a discrepancy at these ages as more probably arising from an error in the enumerated than in the calculated survivors, the latter have been preferred and retained at this age period in the above table. Finally, the whole series has been rateably adjusted so as to aggregate to the adopted totals of 19,160,000 males and 20,828,000 females.

The average ages of the mid-1931 population according to the estimated age distribution shown in cols. 2-4 of Table LXVIII are 31.8 and 33.5 for males and females respectively, as compared with averages of 29.9 and 31.2 at the last census, representing increases in the average age of 1.9 and 2.3 during the ten years. Between 1911 and 1921 the average ages increased by 1.9 and 2.1 respectively.

**Local Populations.**—In the preliminary report on the Census of 1931, total enumerated populations, with sex distinction, were published for all counties, boroughs, urban districts and rural districts in England and Wales. It is to be observed that the figures so issued refer to the *de facto* populations, i.e., the populations actually found within the several areas on Census night, and that, as is pointed out in the introduction to the report, these, for a variety of reasons, may, in some areas, differ from the corresponding figures to be obtained from a classification based upon the residence of the individuals concerned.

In the vital statistics covered by the Registrar-General's Statistical Review, births and deaths are classified strictly by residence and the annual estimates of population, representing the exposed to risk in each case, are designed to reflect as far as possible a residence distribution of population.

In order, therefore, that the census figures may adequately serve their function of guide posts in the chain of annual estimates, the *de facto* returns must first be reviewed and where necessary, modified with a view to securing that the resulting distribution shall conform as nearly as is possible to the residence principle. The steps taken towards that end in respect of the 1921 Census were fully set out in the Statistical Review for 1921; and, owing to the exceptional circumstances which attended the taking of that Census, considerable divergence between census and resident population was disclosed in a number of areas.



In respect of 1931, means for obtaining a distribution of the population by residence have been specifically provided in the Census returns themselves, by the inclusion in the Census Schedule of a question designed to secure on behalf of each person enumerated a statement of his or her address of usual residence, and for the population estimates of 1932 and subsequent years it will be possible to make full use of the information thus gained. But for the present year 1931, the issue of the estimates could not await the full analysis of the Census returns and approximate adjustments to the enumerated figures were, therefore, introduced which, though not possessing quite the authority of examined census material, will probably be found to be adequate for the majority of areas in the country. These have taken the form of eliminating from the enumerated populations all persons whose "usual residences" as returned at the Census were recognised by the local registrars as being outside the boundaries of the area of enumeration (borough, urban district or rural district), and redistributing such visitors by (a) crediting areas containing boarding schools with numbers corresponding to their absent boarders as ascertained from a special local enquiry and (b) distributing the balance of visitors over all areas in proportion to their populations. A small final adjustment was made in order to secure that the several local populations aggregated to the previously approved estimates for the country as a whole.

*Non-Civilian Population.*—It will be observed in the tables in which the estimated local populations are given (Table 17 and Table E) that the local deaths and death-rates refer to civilians only and in conjunction with these a civilian population should preferably be used instead of a total population containing a number of non-civilians. In the majority of areas, the two populations are practically identical, and no special measures have been necessary in respect of them, but in areas in which the non-civilians were numerous, estimates of civilian populations have been provided in addition to total populations and are shown in footnotes appended to the tables.

*Institutions.*—In the Census classification of population according to residence, the populations of institutions, e.g. Public Assistance Institutions, Infirmaries, Hospitals, Mental Institutions, etc., have been 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 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, 1931.*—Sex and age distributions have been prepared for the large aggregates of areas shown in Table LXIX. The populations at ages under

five were obtained by the survivorship method (*see* page 109), and for later ages the total populations estimated by the method 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

Table LXIX.—Estimated Population by Sex and Age in the middle of the Year 1931\*

(Figures given to the nearest hundred)

Note:—For the constitution of the several regions *see* page 8.

	All Ages.	0—	5—	15—	25—	35—	45—	55—	65—	75 and upwards.
England and Wales . . . . .	19,160,0 20,828,0	1,518,4 1,486,2	3,297,0 3,228,1	3,401,7 3,505,9	3,072,9 3,353,1	2,514,9 2,956,4	2,301,7 2,632,6	1,771,7 1,967,2	959,3 1,191,5	322,4 507,0
<i>Regional Summary:—</i>										
South-East . . . . .	6,310,1 7,105,0	481,2 469,6	1,032,3 1,006,1	1,145,4 1,213,0	1,035,4 1,166,3	832,6 915,6	763,7 885,9	581,6 685,9	322,4 428,9	115,5 197,5
Greater London . . . . .	3,827,4 4,364,8	293,1 286,8	625,8 614,0	707,4 784,8	649,8 750,6	514,8 633,6	462,8 552,5	342,2 399,3	174,2 237,6	57,3 105,6
Remainder of South East . . . . .	2,482,7 2,740,2	188,1 182,8	406,5 392,1	438,0 428,2	385,6 415,7	317,8 317,8	300,9 363,1	239,4 286,6	148,2 191,3	58,2 91,9
North . . . . .	6,330,2 6,834,2	514,3 506,4	1,115,5 1,098,8	1,117,2 1,155,0	1,011,5 1,106,4	840,9 978,3	767,7 868,6	586,8 636,1	292,8 356,6	83,5 128,0
North I . . . . .	1,119,1 1,135,5	101,9 100,1	224,6 219,4	199,0 190,3	170,2 178,9	141,0 153,7	125,2 130,5	95,4 93,5	48,1 51,1	13,7 18,0
North II . . . . .	625,0 654,7	53,9 52,7	112,4 110,7	111,7 108,7	96,3 99,8	78,3 89,3	72,7 80,8	55,9 59,9	32,0 37,0	11,8 15,8
North III . . . . .	1,689,5 1,795,4	129,7 128,0	284,6 280,1	290,7 303,2	273,0 296,0	224,6 259,0	207,3 229,5	159,5 170,5	78,1 95,0	22,0 34,1
North IV . . . . .	2,916,6 3,248,6	228,8 225,6	493,9 488,6	515,8 552,8	472,0 531,7	397,0 476,3	362,5 427,8	276,0 312,2	134,6 173,5	36,0 60,1
Midland . . . . .	3,362,1 3,589,2	276,6 269,8	595,0 583,1	595,4 616,2	546,6 581,6	434,7 500,3	393,4 437,3	301,8 323,2	163,2 194,9	55,4 82,8
Midland I . . . . .	2,200,5 2,361,0	183,6 179,1	393,9 386,8	391,4 406,0	355,3 379,6	283,1 326,5	256,0 286,2	196,7 213,0	105,2 128,3	35,3 55,5
Midland II . . . . .	1,161,6 1,228,2	93,0 90,7	201,1 196,3	204,0 210,2	191,3 202,0	151,6 173,8	137,4 151,1	105,1 110,2	58,0 66,6	20,1 27,3
East . . . . .	890,9 925,1	70,7 68,7	153,6 148,4	155,0 146,6	132,9 135,2	108,9 124,3	106,1 116,1	85,4 91,5	55,4 62,7	22,9 31,6
South-West . . . . .	972,0 1,075,9	72,0 69,9	155,7 152,0	163,4 162,5	150,2 160,3	126,9 151,5	118,2 141,0	97,5 116,1	63,0 82,0	25,1 40,6
Wales . . . . .	1,294,7 1,298,6	103,6 101,8	244,9 239,7	225,3 212,6	196,3 203,3	170,9 179,9	152,6 154,0	118,6 114,4	62,5 66,4	20,0 26,3
Wales I . . . . .	961,8 943,0	77,7 76,5	187,0 183,3	168,7 157,6	146,6 150,4	129,4 131,8	113,0 108,6	85,1 77,1	42,0 41,9	12,3 15,8
Wales II . . . . .	332,9 355,6	25,9 25,3	57,9 56,4	56,6 55,0	49,7 52,9	41,5 48,1	39,6 45,4	33,5 37,3	20,5 24,5	7,7 10,7
<i>Density Summary of all Areas outside Greater London:—</i>										
County Boroughs . . . . .	6,027,6 6,668,2	495,1 486,7	1,054,2 1,041,7	1,067,5 1,159,6	967,8 1,079,1	799,8 944,9	729,8 842,9	552,6 616,3	277,5 357,7	83,3 139,3
Other Urban Districts . . . . .	5,400,0 5,834,9	419,5 411,5	936,3 918,0	948,7 957,0	859,8 926,6	709,1 827,4	652,3 745,4	506,7 563,3	275,1 343,5	92,5 145,2
Rural Districts . . . . .	3,905,0 3,960,1	310,7 301,2	680,7 654,4	678,1 604,5	595,5 596,8	491,2 550,5	456,8 494,8	370,2 388,3	232,5 252,7	89,3 116,9

\* Adjusted to allow for changes in boundary during the year.

modified to allow for the slight change between the date of the Census and the middle of the year (1931) in the age distribution of the total population of the country. This table will in future appear in Part I of the Review (Table 2).



**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 1892 in Table A.

### MARRIAGES

The marriages registered in England and Wales during the year 1931 numbered 311,847, corresponding to a rate of 15·6 persons married per 1,000 of the population of all ages and conditions. The number so registered is 3,262, or 1·04 per cent. fewer than the number registered in 1930.

The current rate though slightly below that of last year is not significantly different from the rates experienced in recent years, and is somewhat above the general level of pre-war rates. It is a matter for comment, if not for surprise, that the marriage frequency shows such little apparent relationship with changes in economic conditions, and that with one-fifth or more of the insured population unemployed in 1931, marriages are relatively more numerous than they were in 1927–29, when unemployment was at but half the present level or than they were in the more prosperous pre-war era.

The preference for the third quarter, noticeable in the records since the beginning of the present century, was maintained in 1931, the marriages in this period being 31·9 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, representing 14·9 per cent. of the year's marriages, retained its customary place in being lower than that of any of the later quarters.

It may be observed here that by the Age of Marriage Act, 1929, the minimum age at which marriage may be contracted was made 16 in respect of each sex as from the 10th May, 1930, in place of the hitherto recognised minimum of 14 and 12 for males and females respectively; 1931 is thus the first complete year subject to the operation of the higher minimum age, but the effect on the total numbers is of course insignificant and the change has no material influence on the continuity of the statistical record.

In the following table the marriages both of the current year and of a series of past periods 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 of the behaviour 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 war—it is their numbers which primarily determine the marriageability of the population, so that, from one point of view, the male ratios might be regarded as providing the better indexes to the variations which have occurred from time to time in the incidence of marriage.

**Table LXX.**—England and Wales. Annual Number of Marriages of Men and Women per 1,000 Unmarried Population of each Sex aged 15 and over, 1871–1931.

NOTE.—The annual numbers of marriages have been taken as the average of the three years about each Census prior to 1921. During the period 1920–22 the marriage-rates were changing rapidly and it has been deemed preferable to show the rates for this period by individual years.

Year.	Bachelors, Widowers, Spinsters and Widows.	Bachelors and Widowers.	Spinsters and Widows.
1870–1872 ..	57·2	62·3	52·9
1880–1882 ..	51·5	56·0	47·6
1890–1892 ..	49·8	54·6	45·7
1900–1902 ..	48·7	53·5	44·7
1910–1912 ..	46·3	50·8	42·5
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 .. ..	46·7	53·4	41·5

**Fluctuations of the general Marriage-rate in different Sections of the Country.**—In Tables LXXI and LXXII 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 for several reasons. 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 adjacent localities. Again, it has only been possible till now to tabulate marriages by registration areas, while the available estimates of population for years other than census years refer to administrative areas. The populations upon which the rates for such years



Table LXXI.—Marriages of each year in Geographical Sections of the Country : 1914–1931.

Note :—For the constitution of the several Geographical Sections see Statistical Review, 1930, Part II, page 7.

	North.	Midlands.	South.	Wales.	England and Wales.
1914 ..	100,926	87,695	85,728	20,052	294,401
1915 ..	115,694	109,844	113,868	21,479	360,885
1916 ..	90,287	84,895	87,322	17,342	279,846
1917 ..	83,151	78,761	80,356	16,587	258,855
1918 ..	92,381	87,798	89,928	17,056	287,163
1919 ..	125,863	111,180	107,971	24,397	369,411
1920 ..	136,443	114,942	102,930	25,667	379,982
1921 ..	110,864	97,218	91,831	20,939	320,852
1922 ..	101,335	91,657	86,610	19,922	299,524
1923 ..	99,640	89,483	83,152	20,133	292,408
1924 ..	100,400	92,035	84,252	19,729	296,416
1925 ..	99,301	92,172	84,882	19,334	295,689
1926 ..	89,777	89,146	84,617	16,320	279,860
1927 ..	102,245	97,750	88,867	19,508	308,370
1928 ..	98,642	96,381	89,499	18,706	303,228
1929 ..	102,058	101,130	90,981	19,147	313,316
1930 ..	101,777	101,588	92,528	19,216	315,109
1931 ..	99,733	101,976	91,212	18,926	311,847

are based have, therefore, to be derived from the estimated populations of the corresponding aggregates of administrative counties and county boroughs on the assumption of a ratio between the population of the registration and administrative areas. Any error so introduced is probably small and not likely to have any appreciable effect upon the rates quoted.

The order of the sectional frequencies is generally associated inversely with the masculinity of the several areas, the male rate being highest where the proportion of men in the population is lowest, thus accounting for the apparent contrasts produced by Wales on the one hand, which returns the lowest male frequency and the highest female frequency, or by the South on the other, where conditions are reversed. London females furnish the chief exception to this rule in exhibiting a high marriage rate notwithstanding their excess of numbers in the general population. The range of variation amongst females is, as usual, much less than amongst males in the several sections ; this may be due to a greater constancy in the marriage force in the case of the female sex or it may signify little more than that they have the greater share in determining where the marriage is to take place.

From the analysis in Table F it will be seen that among the counties there compared, the 1931 marriage-rate was highest in London, where it exceeded the mean for the country by 21·2 per

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

	Rate per 1,000 Unmarried Population aged 15 and over.			Ratio of local rate to England and Wales rate (taken as 1,000).		
	1921	1930	1931	1921	1930	1931
<b>Males</b>						
England and Wales	60·4	55·6	53·4	1,000	1,000	1,000
North ..	61·6	53·8	52·0	1,020	968	974
Midlands ..	60·1	56·3	55·1	995	1,013	1,032
South (including London)	62·2	60·2		1,030	1,083	
Wales ..	49·5	44·9	45·0	820	808	843
London ..	71·7	70·8	61·7	1,187	1,273	1,155
<b>Females</b>						
England and Wales	45·8	42·0	41·5	1,000	1,000	1,000
North ..	48·7	42·3	41·4	1,063	1,007	998
Midlands ..	46·1	42·9	41·4	1,007	1,021	998
South (including London)	41·8	40·1		913	955	
Wales ..	49·5	44·6	44·4	1,081	1,062	1,070
London ..	46·5	45·6	42·4	1,015	1,086	1,022

1931

	Rate per 1,000 Unmarried Population aged 15 and over.		Ratio of local rate to England and Wales rate (taken as 1,000).	
	Males.	Females.	Males.	Females.
South-East ..	56·2	39·9	1,052	961
North ..	52·0	41·4	974	998
North I ..	49·1	47·1	919	1,135
North II ..	47·9	41·5	897	1,000
North III ..	53·4	42·4	1,000	1,022
North IV ..	53·2	39·2	993	945
Midland ..	55·7	45·0	1,043	1,084
Midland I ..	55·1	44·0	1,032	1,060
Midland II ..	56·8	46·9	1,064	1,130
East ..	49·6	43·6	929	1,051
South-West ..	51·7	38·4	968	925
Wales ..	45·0	44·4	843	1,070
Wales I ..	46·4	49·3	869	1,188
Wales II ..	41·1	34·2	770	824

\* For the constitution of the several sections and the differences between the old and new divisions see page 8.



cent. followed in order by Nottinghamshire, Warwickshire and Leicestershire, with excesses in the neighbourhood of 4-7 per cent. Rural counties, with few exceptions, retain their customary place at the other end of the list. Several of the Metropolitan Boroughs return very high rates.

Marriage-rates by ages, which should provide an even more exact statement of the incidence and intensity of marriage, are shown in Table LXXIII. As the rates in this table have reference only to periods in the neighbourhood of a census, their margin of error is much less than that to which rates are subject when based on estimates of population for post-censal years.

It will be observed from the last column of Table LXXIII 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 1931 frequencies are all lower than those of 1921, the percentages to the 1921 frequencies being, in order, spinsters 96, widowers 85, bachelors 83, and widows 74. On this basis of comparison the marriage frequencies of bachelors and spinsters are markedly higher than they were for a number of years before the war—while the reverse is the case amongst widows whose frequencies are incomparably lower than any hitherto recorded for this class in the table.

From the age analysis shown in the earlier columns of Table LXXIII, it will be seen that the 1931 rates for all four sections have decreased as compared with those for 1921 in all age-groups from 20 to 55, and that the decrease among 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 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.

Widowers' and widows' rates as compared with 1921 show a consistent fall in all the age divisions identified except under 20 years of age, where, of course, the numbers involved are too small to yield consistent records. Widowers' rates throughout are largely in excess of the corresponding bachelors' rates, so that it may be said that re-marriages in the case of males are relatively more frequent than first marriages. The same was, until recently, true of females but the maintenance of the rates amongst young spinsters in conjunction with a heavy and continuous fall in respect of widows has destroyed the supremacy of

the latter at ages below 35 and only at ages above are the widows' rates materially in excess. 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 LXXIII; 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 in the case of males are in favour of the widowed.

Table LXXIII.—England and Wales. Annual Marriage-rate per 1,000 Bachelors, Widowers, Spinsters, and Widows respectively at each of several Age Periods, 1871-1931.

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

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	891	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	161.1	61.6	19.7	5.5	62.5	1,000	62.5	1,000
1931	3.3	72.5	140.8	52.3	18.0	5.7	56.2	899	67.5	833
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	1,303	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	155.2	73.5	15.8	44.6	1,000	44.6	1,000
1931	62.5	134.3	170.8	123.0	64.8	14.8	33.0	740	38.7	853
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	1.3	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	17.0	106.5	96.9	22.3	8.2	2.2	51.8	956	53.9	961
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	55.6	105.8	90.4	33.4	13.7	2.2	8.7	483	11.8	737



Table LXXIV shows how the proportions of first marriages and re-marriages have varied from 1918 to 1931. In 1931 there was a higher proportion of first marriages, and, consequently, a lower proportion of re-marriages, than in any of the previous years.

Table LXXIV.—England and Wales : Proportions of First Marriages and Re-marriages in 1,000 Marriages, 1918–1931.

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

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 1931 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.

**Marriages of Minors.**—Of the males married during the year, 13,574, or 4·35 per cent., were under the age of 21, and of the

Table LXXV.—England and Wales : Minors Married per 1,000 Marriages at all Ages, 1876–1931.

Year.	Husbands.	Wives.	Year.	Husbands.	Wives.
1876–80 ..	77·8	217·0	1919 ..	43·7	129·4
1881–85 ..	73·0	215·0	1920 ..	46·8	142·9
1886–90 ..	63·2	200·2	1921 ..	48·2	149·2
1891–95 ..	56·2	182·6	1922 ..	44·4	144·4
1896–1900 ..	51·2	168·0	1923 ..	42·5	142·9
1901–05 ..	46·3	153·1	1924 ..	40·4	140·3
1906–10 ..	40·3	139·4	1925 ..	40·6	142·3
1911–15 ..	39·2	136·6	1926 ..	43·3	147·5
1916–20 ..	42·6	133·3	1927 ..	41·4	146·1
1921–25 ..	43·3	143·9	1928 ..	43·5	151·5
1926–30 ..	42·5	150·5	1929 ..	41·8	151·7
1917 ..	41·7	134·2	1930 ..	42·6	155·3
1918 ..	42·6	129·0	1931 ..	43·5	158·5

females 49,435, or 15·85 per cent., as compared with 4·26 per cent., and 15·53 per cent. last year respectively. Females, who have always greatly outnumbered the males in this class—in the present year the ratio is about 3½ 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 females aged 15–21

Table LXXVI.—England and Wales : Annual Marriage-rate per 1,000 Unmarried and Widowed Persons in the age-group 15–21 in 1901, 1911, 1921, 1931 and 1927–31.

Year.	Males.		Females.	
	Rate.	Ratio to 1921.	Rate.	Ratio to 1921.
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

in 1911, were 26·6 in 1920, and are now 24·8, while the corresponding rates for males were 5·5, 8·8 and 6·7 per 1,000 respectively. The 1931 experience continues the increasing trend which has been observable during the last few years. As a result of the Age of Marriage Act, 1929, which raised the age of marriage of both sexes to 16 years, no marriages are now scheduled at ages



below 16, the year 1931 being the first to be completely affected in this way. In the three years prior to the passing of the Act, marriages under 16 averaged 45 per annum (2 boys and 43 girls), but whether the effect of the Act has been to increase, *pro tanto*, the marriages at higher ages or not, the numbers are immaterial and hardly sufficient to influence the statistical record.

Table LXXVII.—Marriage-rate of Minors per 1,000 Unmarried Population aged 15-21 in Geographical Sections of the Country, 1921 and 1931.

	Males.				Females.			
	Rate per 1,000 Unmarried Population 15-21.		Ratio of local rate to England and Wales rate.		Rate per 1,000 Unmarried Population 15-21.		Ratio of local rate to England and Wales rate.	
	1921.	1931.	1921.	1931.	1921.	1931.	1921.	1931.
England and Wales.	7.7	6.7	1,000	1,000	23.4	24.8	1,000	1,000
North..	9.3	7.2	1,208	1,075	26.1	25.7	1,115	1,036
Midlands ..	7.5	6.6	974	985	22.1	24.0	944	968
South (including London). Wales..	6.1		792		20.8		889	
London ..	6.7	5.5	870	821	26.7	28.0	1,141	1,129
London ..	7.8	7.0	1,013	1,045	22.2	23.3	949	940

## 1931

	Rate per 1,000 Unmarried Population 15-21.		Ratio of local rate to England and Wales rate.	
	Males.	Females.	Males.	Females.
	England and Wales ..	6.7	24.8	1,000
South-East ..	6.2	22.9	925	923
North ..	7.2	25.7	1,075	1,036
North I ..	6.9	32.4	1,030	1,306
North II ..	6.1	28.8	910	1,161
North III ..	7.8	26.4	1,164	1,065
North IV ..	7.3	22.3	1,090	899
Midland ..	7.3	24.8	1,090	1,000
Midland I ..	6.5	23.0	970	927
Midland II ..	8.7	28.3	1,299	1,141
East ..	6.9	28.5	1,030	1,149
South-West ..	6.2	24.3	925	980
Wales ..	5.5	28.0	821	1,129
Wales I ..	6.0	31.2	896	1,258
Wales II ..	3.9	18.6	582	750

Comparative figures are shown in Table LXXVI 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 LXXV.

The proportions of males and females marrying under age are summarised for regions in Table LXXVII. Much of the variation there shown is but a reflex of the incidence of the general marriage-rate (Table LXXII), and regard must necessarily be had to the latter in considering how far the former provides evidence of local custom regarding early marriage.

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

During the year 1931, 3,668 divorces and 96 annulments were obtained, the number of persons involved being twice these figures, or a total of 3,764 of each sex. The present figure is somewhat less than the record achieved in 1928 but with that exception it is higher than any previously recorded.

From Table LXXVIII 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

Table LXXVIII.—England and Wales : Annual Number of Persons Divorced, and of Divorced Persons who Remarried, 1876-1931.

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 inter-marrying.	Divorced women marrying bachelors.	Divorced women marrying widowers.
		1876-80 ..	554	104	56	48	42	12	4
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



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.

In Table P are given certain particulars concerning the marriages in respect of which suits for dissolution or annulment were commenced during the year.

3,520 Petitions were filed at the Principal Registry in London and 919 at 38 District Registries. In respect of the former 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 214 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 15 per cent. of shorter duration, while in 54 per cent. the marriages have subsisted for 10 years or more. Forty-two per cent. of the marriages in question were childless, and in a further 30 per cent. there was one child only.

**Buildings in which Marriages may be Solemnized.**—At the end of the year 1931 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 :—

Established Church and Church in	
Wales .. .. .	16,414
All other religious denominations ..	20,276
	<hr/>
Total .. .. .	36,690
	<hr/>

The increase upon the numbers at the end of the previous year was :—Established Church and Church in Wales 16, other religious denominations 207. 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 public 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 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 31st December, 1931, and the number of buildings registered for the solemnization of marriages are shown in Table LXXIX.

Table LXXIX.

Denomination.	Buildings certified to the Registrar-General as meeting-places for Religious Worship.	Buildings registered for the Solemnization of Marriages.*
Roman Catholics .. .. .	1,855	1,724
Wesleyan Methodists .. .. .	7,763	4,873
Congregationalists .. .. .	3,484	3,193
Baptists .. .. .	3,333	3,005
Primitive Methodists .. .. .	4,321	2,246
United Methodist Church .. .. .	1,998	1,363
Calvinistic Methodists .. .. .	1,375	1,082
Presbyterians .. .. .	460	454
Unitarians .. .. .	186	197
New Church .. .. .	59	62
Catholic Apostolic Church .. .. .	63	51
Countess of Huntingdon's Connexion .. .. .	45	40
Salvation Army .. .. .	1,366	314
Society of Friends .. .. .	418	†
Jews .. .. .	295	†
Other Denominations .. .. .	4,520	1,672
All Denominations .. .. .	31,541	20,276

\* 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.

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 1931, the number of such buildings which had been brought under the operation of the Act, and so remained, was 6,339 out of the total of 20,276. The numbers of these buildings, and the denominations to which they belonged, were as follows :—

2,632	Wesleyan Methodists.
905	Congregationalists.
1,005	Primitive Methodists.
648	Baptists.
555	United Methodist Church.
157	Calvinistic Methodists.
437	Other Denominations and Unsectarian.
<hr/>	
6,339	All Denominations.
<hr/>	



## LIVE BIRTHS

The live births registered during 1931 numbered 632,081, corresponding to a birth-rate of 15·8 per 1,000 of the population living.

The number of births is 16,730 less than those of 1930, a decrease of 2·58 per cent.

The current rate of 15·8 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 1929 and 1930 figures that the particular phase of movement associated with post-war adjustments was drawing to a close with a tendency towards stabilisation at or about those levels. The 1931 returns, however, show a further decline, and it would be useless to speculate, at the present time, as to where the trough of post-war depression may be located. As explained on pages 133 and 134 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 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; it is now 15·8 per 1,000, or considerably less than half the maximum figure of 36·3 recorded in 1876. The element of personal control in the matter of reproduction which alone can account for so great a change in the birth-rate over a period of a few decades must generally frustrate any attempt at statistical forecasting and the most that can be said is that, having regard to current economic and industrial conditions, the birth-rate appears likely for some time to remain low in relation to all earlier periods for which we have reliable records.

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 1930 or 1931 (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 both earlier and later years sufficient to indicate the more prolonged changes which may probably be associated with the events of that period.

Of the countries for which 1931 returns are available, only two (Hungary and the Netherlands) record increases in their birth-rates, while the remaining 19 show decreases. In view of the further experience of this country, 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 and Japan the current 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, while to-day it is lower than any countries save Austria and Sweden, the former having an equal, and the latter an even lower rate. 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, Sweden, and Switzerland.

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 only reasonably be made in respect of short periods of adjacent years.

In order to exclude the effect of varying population constitution and so obtain a truer statement of fertility change, the method of standardization, described in the 1922 Review and adopted in connexion with the statistics of the years 1922-1930, has been continued to cover the experience of 1931. It consists in (1) adopting the fertility curve or fertility ratios experienced in 1921 as a standard, (2) applying them age by age to the appropriate women in the population in question—for the years subsequent to 1921 estimates of such women have been made for the purpose—and so obtaining a standard number of births, the numbers which would have occurred had the standard birth-rates been operating, and (3) calculating the ratio of the actual births recorded to the standard or expected number; the ratio of actual to expected is thus an index, comparing in an integral form the actual experience of each period or year with a common standard and, therefore, with one another.

Standardized comparisons are given in the last column of Table LXXX both for census years prior to 1921 and thereafter for individual years and the results are contrasted in that table with the more familiar and more approximate comparisons given by the crude birth-rates, whether



Table LXXX.—England and Wales.—Birth-rates and Fertility, 1871-1931.

	Births per 1,000 Total Population.	Ratio to 1921.	Births per 1,000 Married Women, 15-45.	Ratio to 1921.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
<b>Legitimate Births.</b>					
1871 (1870-72)	33.3	1,556	292.5	1,659	1,504
1881 (1880-82)	32.3	1,509	286.0	1,622	1,481
1891 (1890-92)	29.4	1,374	263.8	1,496	1,382
1901 (1900-02)	27.5	1,285	235.5	1,356	1,250
1911 (1910-12)	23.4	1,083	197.4	1,120	1,102
1921	21.4	1,000	176.3	1,000	1,000
1922	19.5	911	160.7	912	909
1923	18.9	883	155.3	881	877
1924	18.1	846	148.4	842	835
1925	17.5	818	143.5	814	805
1926	17.0	794	139.8	793	783
1927	15.9	743	130.8	742	732
1928	16.0	748	131.0	743	730
1929	15.5	724	126.6	718	704
1930	15.6	729	126.4	717	701
1931	15.1	706	122.9	697	695
	Births per 1,000 Total Population.	Ratio to 1921.	Births per 1,000 Unmarried Women, 15-45.	Ratio to 1921.	Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
<b>Illegitimate Births.</b>					
1871 (1870-72)	1.96	1,922	17.0	2,152	2,051
1881 (1880-82)	1.65	1,618	14.1	1,785	1,688
1891 (1890-92)	1.31	1,284	10.5	1,329	1,247
1901 (1900-02)	1.12	1,098	8.5	1,076	1,008
1911 (1910-12)	1.03	1,010	7.9	1,000	968
1921	1.02	1,000	7.9	1,000	1,000
1922	0.89	873	7.0	886	887
1923	0.82	804	6.5	823	818
1924	0.78	765	6.2	785	782
1925	0.74	725	5.9	747	748
1926	0.76	745	6.0	759	768
1927	0.74	725	5.9	747	752
1928	0.75	735	6.0	759	772
1929	0.74	725	6.0	759	761
1930	0.75	735	6.0	759	777
1931	0.70	686	5.7	722	712
	Births per 1,000 Total Population.	Ratio to 1921.			Ratio of Actual Births to those which would have occurred had the Standard age rates been operating.
<b>All Births.</b>					
1871 (1870-72)	35.3	1,576	—	—	1,527
1881 (1880-82)	34.0	1,518	—	—	1,490
1891 (1890-92)	30.7	1,371	—	—	1,376
1901 (1900-02)	28.6	1,277	—	—	1,238
1911 (1910-12)	24.5	1,094	—	—	1,095
1921	22.4	1,000	—	—	1,000
1922	20.4	911	—	—	908
1923	19.7	879	—	—	874
1924	18.8	839	—	—	833
1925	18.3	817	—	—	802
1926	17.8	795	—	—	782
1927	16.6	741	—	—	732
1928	16.7	746	—	—	732
1929	16.3	728	—	—	707
1930	16.3	728	—	—	704
1931	15.8	705	—	—	696

calculated per 1,000 total population or per 1,000 married women between ages 15 and 45. Thus, in 1871, 1,504 legitimate births were recorded for every 1,000 that would have occurred under the standard fertility rates, the 1921 experience being in the aggregate only two-thirds of that of 50 years before. From 1871 the rates diminished steadily and progressively as shown by the comparative figures, which are 1,481, 1,382, 1,250, and 1,102 at successive ten-year intervals between 1881 and 1911. Since 1921 the even more rapid drop, commented upon in dealing with the crude rates, is shown by the further reductions in the index, which for 1931 is 695. 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 1911 the tendency has been in the other direction.

**Illegitimate Births.**—The live births registered during 1931 include 28,086 of illegitimate children, a decrease of 1,596 on the number in 1930, coincident with the decrease of 16,730 in total births. Illegitimate births have thus decreased by 5.4 per cent., and legitimate births by 2.4 per cent. As a result of these changes, the proportion of illegitimate to total births has fallen from 4.57 per cent. last year to 4.44 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 LXXX to allow for the age distribution of the potential mothers in respect of illegitimate as well as legitimate births. The standard age factors employed are, as described in the 1922 Review, of less authority than those in respect of legitimate fertility, and serve mainly to complete the tables on the lines followed and already described for married women.

**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 LXXXI for the new geographical regions, and their sub-divisions.

The method employed in earlier paragraphs for comparing the fertility of England and Wales in different years by the use of a standard fertility curve applies equally well of course 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 have been, as far as possible, eliminated.

Table LXXXI shows for each of the specified divisions of the country the crude birth-rate of 1931, 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 1921 in conjunction with the census populations of 1931.



Table LXXXI.—England and Wales and Regions of the Country.—  
Birth-rates, 1921 and 1931.

For the constitution of the several regions, see p. 8.

	All Births.				Illegitimate Births.			
	Birth-rate per 1,000 Total 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 Total 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)
1931								
England and Wales ..	15.8	1,000	696	1,000	0.70	1,000	712	1,000
<b>Regional Summary—</b>								
South-East ..	15.0	949	659	947	0.68	971	655	920
Greater London ..	15.2	962	647	930	0.66	943	594	834
Remainder of South-East.	14.8	937	680	977	0.71	1,014	773	1,086
North ..	16.3	1,032	714	1,026	0.72	1,029	734	1,031
North I ..	19.0	1,203	814	1,170	0.79	1,129	896	1,258
North II ..	17.5	1,108	802	1,152	0.98	1,400	1,062	1,492
North III ..	15.4	975	650	934	0.66	943	679	954
North IV ..	15.6	987	696	1,000	0.68	971	653	917
Midland ..	16.5	1,044	709	1,019	0.65	929	666	935
Midland I ..	16.7	1,057	731	1,050	0.62	886	631	886
Midland II ..	16.2	1,025	670	963	0.70	1,000	736	1,034
East ..	15.8	1,000	734	1,055	0.88	1,257	1,016	1,427
South-West ..	14.4	911	680	977	0.66	943	732	1,028
Wales ..	16.3	1,032	739	1,062	0.74	1,057	832	1,169
Wales I ..	16.8	1,063	719	1,033	0.64	914	738	1,037
Wales II ..	15.1	956	808	1,161	1.02	1,457	1,068	1,500
<b>Density Summary of all Areas outside Greater London—</b>								
County Boroughs ..	16.5	1,044	716	1,029	0.74	1,057	726	1,020
Other Urban Districts..	15.5	981	680	977	0.65	929	687	965
Rural Districts ..	15.8	1,000	740	1,063	0.75	1,071	888	1,247
1921								
England and Wales ..	22.4	1,000	1,000	1,000	1.02	1,000	1,000	1,000
North ..	23.7	1,058	1,025	1,025	1.12	1,098	1,091	1,091
Remainder of England (including London).	21.4	955	972	972	0.96	941	937	937
Wales ..	25.0	1,116	1,099	1,099	1.03	1,010	1,108	1,108
London A.C. . . .	22.1	987	957	957	0.89	873	788	788
1931								
England and Wales ..	15.8	1,000	696	1,000	0.70	1,000	712	1,000
North ..	16.3	1,032	714	1,026	0.72	1,029	734	1,031
Remainder of England (including London).	15.5	981	681	978	0.69	986	688	966
Wales ..	16.3	1,032	739	1,062	0.74	1,057	832	1,169
London A.C. . . .	15.0	949	664	954	0.78	1,114	667	937

For 1931, the birth changes which have occurred since 1930 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 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 the portion of the South-East outside Greater London. Crude rates for illegitimate births are highest in Wales II and North II, and lowest in Midland I and Wales I.

Among the regional rates, the ratios of which are shown in Table LXXXII, Wales took the first place from 1921 to 1926, was equal with the North in 1927, and second to the North from 1928 to 1930. In 1931 equality is again recorded.

These percentages 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 LXXXI, the standardized ratio of North II retains the highest place, but in several instances, the process results in altering materially the relative position of an area; for instance, the ratio for Wales II rises from 956 (crude) to 1,161 (standardized). 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.

Table LXXXII.—Birth-rate of Different Sections of the Country per cent. of that of England and Wales, 1921–31.

	1921.	1922.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.
North ..	106	104	104	106	105	106	104	105	104	104	103
Midlands ..	99	100	99	99	99	99	102	101	101	101	} 98
South ..	91	94	94	92	92	92	93	93	93	93	
Wales ..	112	107	110	112	110	108	104	104	102	102	

The extent of illegitimacy in different classes of area and parts of the country may be gathered from the right half of Table LXXXI. Except for a wider range of variation generally the 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 6.3 per cent. above the mean, for illegitimate only it is 24.7 per cent. above. The table confirms generally the view expressed in earlier reports, when only crude rate comparisons were available, that such rates understated the position in rural districts and overstated it in the South.

**Sex Proportions at Birth.**—Births of males in England and Wales in 1931 numbered 323,565, and those of females 308,516; the proportion of male to female births was 1,048, 1,059, and 1,049



to 1,000 for legitimate, illegitimate, and total births respectively. The corresponding proportions for total births in each year from 1891 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 LXXXIII.

Table LXXXIII.—Male Births per 1,000 Female Births, 1931.

England and Wales .. .. .	1,049
<b>Regional Summary—</b>	
South-East .. .. .	1,047
Greater London .. .. .	1,048
Remainder of South-East .. .. .	1,046
North .. .. .	1,045
North I .. .. .	1,050
North II .. .. .	1,072
North III .. .. .	1,041
North IV .. .. .	1,040
Midland .. .. .	1,054
Midland I .. .. .	1,052
Midland II .. .. .	1,058
East .. .. .	1,029
South-West .. .. .	1,073
Wales .. .. .	1,056
Wales I .. .. .	1,060
Wales II .. .. .	1,043
<b>Density Summary of all Areas outside Greater London—</b>	
County Boroughs .. .. .	1,043
Other Urban Districts .. .. .	1,057
Rural Districts .. .. .	1,048

### STILLBIRTHS

Stillbirths registered in England and Wales as a whole are shown for each year in 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 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 1931 numbered 26,933 in all, 14,951 being males and 11,982 females; the numbers representing 41, 44 and 37 per 1,000 total births or

43, 46 and 39 per 1,000 live births respectively. The total compares with the figure of 27,577 recorded last year. The integral proportion per 1,000 total births is unaltered.

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.

The definition of a stillbirth laid down in the above mentioned Act is as follows:—

“ ‘ Stillborn ’ and ‘ stillbirth ’ shall apply to any child which has issued forth from its mother after the twenty-eighth week of pregnancy and which did not at any time after being completely expelled from its mother breathe or show any other signs of life.”

The criterion is thus the absence of life, or of signs of life, after complete expulsion and is independent of separation or of viability. The only factor restricting its general application is that of the minimum duration imposed in respect of the period of gestation. In reference thereto it should be noted that the introduction of a time limit, inevitable in the case of a stillbirth, does not affect in any way the existing practice regarding live births; a child which after complete expulsion shows any signs of life is regarded as a live birth, even if the birth occurs before the end of the twenty-eight weeks, and is registrable as such in accordance with the ordinary procedure.

With regard to the effect of registration upon the statistics, it may be observed that, unlike live-birth registration, where the period between birth and registration is frequently as much as a month or more, stillbirth registration is linked administratively with the burial procedure, and the necessity of early disposing of the body automatically reduces the delay to a minimum and thereby secures a close correspondence between the records and facts in a given period. The record will thus, like that also of infant deaths, be slightly out of phase with the corresponding live-birth record with which each of them is usually compared.

The distribution of the total according to sex, legitimacy and geographical incidence is shown in Table 18 of Part I of the Statistical Review, and is summarised in rate form in Table LXXXIV; in the latter have been included columns 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.

This year's summary generally confirms the inferences derived from the previous experience provided by the 1926 Act. Thus,



Table LXXXIV.—Stillbirths, 1931.

Area.	Stillbirths per 1,000 total births.					Stillbirths per 1,000 total births and Live Births per 1,000 population expressed in relation to corresponding rate for England and Wales taken as 1,000.				Stillbirths per 1,000 total births and Infant Mortality per 1,000 live births expressed in relation to corresponding rate for England and Wales taken as 1,000.		
	Total.	Legitimate.		Illegitimate.		Stillbirths.		Live Births.		Stillbirths.	Deaths under 4 weeks.	Deaths under 1 year.
		Males.	Fe-males.	Males.	Fe-males.	Legit.	Illegit.	Legit.	Illegit.			
<b>England and Wales ..</b>	<b>40.9</b>	<b>43</b>	<b>37</b>	<b>60</b>	<b>51</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>	<b>1,000</b>
<b>Regional Summary—</b>												
South-East ..	33.0	35	29	57	41	801	886	954	971	807	812	811
Greater London	32.6	35	28	56	38	794	848	960	943	797	811	889
Remainder of South East.	33.6	36	29	59	46	811	941	934	1,014	822	813	685
North ..	45.3	48	41	66	57	1,109	1,100	1,033	1,029	1,108	1,130	1,200
North I ..	42.6	44	40	47	54	1,050	905	1,205	1,129	1,042	1,196	1,338
North II ..	41.2	42	37	70	57	990	1,145	1,093	1,400	1,007	1,102	1,137
North III ..	45.9	48	42	61	77	1,117	1,233	974	943	1,122	1,135	1,112
North IV ..	47.2	50	43	75	46	1,157	1,095	993	971	1,154	1,105	1,202
Midland ..	41.1	43	38	57	53	1,007	986	1,053	929	1,005	1,047	1,004
Midland I ..	41.3	43	39	57	55	1,015	1,004	1,066	886	1,010	1,025	1,002
Midland II ..	40.5	43	37	58	49	993	959	1,020	1,000	990	1,090	1,009
East ..	39.1	43	34	47	43	963	809	987	1,257	956	965	843
South-West ..	39.8	43	34	61	66	960	1,131	907	943	973	940	798
Wales ..	56.7	62	50	62	66	1,400	1,143	1,033	1,057	1,386	1,170	1,118
Wales I ..	57.7	62	52	62	67	1,428	1,156	1,066	914	1,411	1,182	1,151
Wales II ..	53.6	61	44	61	65	1,316	1,123	934	1,457	1,311	1,135	1,016
<b>Density Summary of all Areas outside Greater London—</b>												
County Boroughs	43.2	46	39	62	54	1,057	1,041	1,046	1,057	1,056	1,066	1,161
Other Urban Districts.	43.9	47	40	59	53	1,080	1,000	980	929	1,073	1,044	977
Rural Districts ..	40.8	43	37	63	57	993	1,075	993	1,071	998	1,017	871

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 is the same as that of last year, both for legitimate and illegitimate births, and it is maintained with considerable uniformity throughout the several sections distinguished. Similarly, as between legitimate and illegitimate births, the latter exhibits the higher rates in all sections (Wales excepted), the amount of the excess being on a somewhat larger scale than that indicated in the comparison between the sexes.

As regards areal comparison, Wales returns legitimate stillbirth frequencies markedly higher than those of any English sections which among themselves decrease generally from the North, where the rate is about 11 per cent. in excess of the general average, to the South-East where it is 20 per cent. below. The contrasts are not so prominent or consistent among the illegitimate frequencies.

The relative positions in the various portions of the country and the close association in this respect between stillbirths and infantile deaths are brought out in the columns of the table in which the stillbirth rate and infantile mortality rate of the year are

expressed in relation to that of the country at large, the latter being taken as 1,000 in each case. The similarity of incidence is marked in comparisons made with the mortality of the full first year of life, but the parallelism is found to be even closer when the comparison is restricted to the deaths occurring within the four weeks immediately following birth.

Some idea of the local variation of stillbirths may be obtained from the following table which shows the boroughs and the county urban and rural aggregates exhibiting the highest and lowest rates per 1,000 total births in 1931. Areas in which less than 20 stillbirths were registered have been omitted.

Table LXXXV.—Stillbirths, 1931. Range of local variation. Stillbirths per 1,000 total births.

Metropolitan Boroughs.	County Boroughs.	Urban Aggregates (Excluding County Boroughs).	Rural Aggregates.
		<i>Highest.</i>	
Westminster ..	43	Merthyr Tydfil .. 71	Glamorganshire .. 63
Stoke Newington ..	41	Dewsbury .. 65	Cardarthenshire .. 61
Finsbury ..	39	Barnsley .. 64	Monmouthshire .. 57
Paddington ..	38	Darlington .. 61	Flintshire .. 55
St. Marylebone ..	38	Bolton .. 60	Lancashire .. 51
		<i>Lowest.</i>	
Deptford ..	27	East Ham .. 34	Cambridgeshire .. 30
Battersea ..	26	Derby .. 34	Buckinghamshire .. 28
Greenwich ..	25	Northampton .. 34	Sussex, West .. 28
Bermondsey ..	24	York .. 32	Hertfordshire .. 28
Hammersmith ..	24	Smethwick .. 30	Sussex, East .. 28
			Yorkshire, East Riding .. 32
			Surrey .. 31
			Buckinghamshire .. 27
			Hertfordshire .. 26
			Sussex, West .. 26

## NATURAL INCREASE

In 1931 the excess of live births over deaths registered in England and Wales was 140,451, as compared with 193,384 in 1930, 111,181 in 1929, and 199,878 in 1928.

From the comparable series of rates per 1,000 living population given in Table R, it will be observed that, though there is rather greater irregularity in the successive rates of natural increase, they have, over the whole range of years there given, followed on the whole a similar course to those followed by both birth and death-rates, and have declined with advancing years. The present rate of natural increase is 3.5 per 1,000 population. Lower rates were recorded in 1918 (0.4) and 1929 (2.9). It compares with a figure of approximately 10 per 1,000 in the years immediately preceding the war and over 14 per 1,000 in the period 1876-1880 when the birth-rate was at about its maximum. Stated in these terms the curve of natural increase expresses no more than that the crude birth-rate has hitherto been greater than the crude death-rate and that the decline in the former has advanced at a greater rate than the fall in the latter. From the general continuity of the series it may be inferred that the number of births will continue to exceed the



deaths for some years, and that, apart from the results of migration, the population will continue to increase during such period, though, naturally, at a somewhat slower pace.

What must not be inferred from mere excesses of births over deaths or from their alternative expressions as rates per 1,000 total population, is that the perpetuation of current conditions regarding fertility and mortality would be sufficient to ensure a continuous increase in the national population, both now and in the remote future.

The population as a whole is gradually getting older, and must continue to do so for many years to come, owing to the heavy falls which have occurred in both fertility and mortality during the past half century. The older sections where the death frequencies are naturally highest are becoming relatively more and more numerous. The crude death-rate (deaths per 1,000 population) must in consequence tend to rise in relation to the true underlying mortality and will thus encroach on the already much diminished margin of natural increase recorded above for recent years. The encroachment would be delayed by a real decrease in mortality or an increase in fertility. But of the proximity of the latter there is no evidence at all; while as regards the former, from the very nature of the case, the lower mortality falls the less room is there for it to fall further, and any practicable assistance from this source is, therefore, being gradually exhausted as the years go by. Moreover any change in the death-rate can have but a temporary effect on a situation which is primarily governed by the rate at which the population is being replenished at its source.

It was suggested in the 1926 Review that if we take as the standard of population stability, not the maintenance of a constant total but the production of a standard number of births, the standard being that number which would in their turn and at the rate they themselves were born produce offspring numerically equal to themselves, the standard would correspond to a crude birth-rate based on the present population of about  $19\frac{1}{2}$  per 1,000. This level has not been reached since 1923—the rate for the present year is only 81 per cent. of the said standard—and the inevitable inference must be drawn that, while there is no improvement, the future growth of population will tend to be at an ever diminishing rate up to the stage at which births and deaths are equal, the latter thereafter gaining the ascendancy with a consequent decline in population.

Table LXXXVI shows for 1931 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).

Table LXXXVI.—Natural Increase per 1,000 living, 1931.

England and Wales	..	..	..	..	3·5
<b>Regional Summary—</b>					
South-East	..	..	..	..	3·4
Greater London	..	..	..	..	3·9
Remainder of South-East	..	..	..	..	2·9
North	..	..	..	..	3·2
North I	..	..	..	..	6·1
North II	..	..	..	..	4·2
North III	..	..	..	..	2·7
North IV	..	..	..	..	2·3
Midland	..	..	..	..	4·6
Midland I	..	..	..	..	4·7
Midland II	..	..	..	..	4·6
East	..	..	..	..	3·4
South-West	..	..	..	..	1·0
Wales	..	..	..	..	3·4
Wales I	..	..	..	..	4·5
Wales II	..	..	..	..	0·7
<b>Density Summary of All Areas outside Greater London—</b>					
County Boroughs	..	..	..	..	3·4
Other Urban Districts	..	..	..	..	3·1
Rural Districts	..	..	..	..	3·7

Table S, which provides an analysis of migration from 1911 onwards, shows that the balance of movement, which for many years had been in the outward direction, has been reversed during the last two years. The net passenger movement into England and Wales was over 90,000 in 1931.

#### 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 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 1892 are set out in Table A.

*Marriages.*—The marriages during the year 1931 numbered 365,001, corresponding to a rate of 14·9 persons married per 1,000 of the total population. This rate was 0·2 per 1,000 below the corresponding rate in 1930 and the same as the average rate in the ten years 1921–1930.



Table LXXXVII.—Great Britain and Ireland. Vital Statistics, 1921–30 and 1931.

	Great Britain and Ireland.	England and Wales.	Scotland.	Northern Ireland.	Irish Free State.
<i>Estimated Population in the middle of the year 1931 (in thousands).</i>					
Males .. .. .	23,597	19,160	2,326	606	1,505
Females .. .. .	25,442	20,828	2,517	645	1,452
Persons .. .. .	49,039	39,988	4,843	1,251	2,957
<i>Marriages.</i>					
1931.. .. .	365,001	311,847	32,652	7,369	13,133
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
<i>Births.</i>					
1931.. .. .	807,060	632,081	92,220	25,673	57,086
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
<i>Deaths.</i>					
1931.. .. .	616,855	491,630	64,229	18,049	42,947
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
<i>Deaths of Infants under 1 year.</i>					
1931.. .. .	55,303	41,939	7,544	1,885	3,935
Per 1,000 births:—					
1921–1930 .. .. .	74	72	89	81	70
1931.. .. .	69	66	82	73	69

*Births.*—The births registered in the year 1931 numbered 807,060, and were in the proportion of 16.5 per 1,000 of the total population. This rate was 0.4 below the corresponding rate in 1930 and 2.3 per 1,000 below the average in the ten years 1921–1930.

*Deaths.*—The deaths registered in the year 1931 numbered 616,855, and were in the proportion of 12.6 per 1,000 of the

total population. This rate was 0.8 per 1,000 above the corresponding rate in 1930, and 0.1 per 1,000 above the average in the ten years 1921–1930.

*Infant Mortality.*—The deaths of infants under one year of age during the year 1931 numbered 55,303, representing a rate of 69 per 1,000 live births. This rate was 6 per 1,000 live births above that recorded in 1930 but 5 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. These returns of births and deaths at sea constitute the "Marine Register Book." During the year 1931 this register was increased by the addition of 111 entries of birth and 1,489 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 1931 by 1,747,405, this addition raising the total of names in the indexes, which at the end of 1931 embraced a period of 94½ years, to 159,696,345 (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 LXXXVIII 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.

The 509,267 gratuitous searches during 1931 comprise 43,549 searches made for the purpose of verifying the ages of persons



Table LXXXVIII.

Years.	Total Searches.	Gratuitous Searches.	Searches paid for by Fees.	Certificates Issued.	Amount Received.
					£ s. d.
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	75,369	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

\* Including some searches made in 1908.

† In addition, there were 91,917 gratuitous searches made for National Insurance Audit purposes.

aged 70 and upwards claiming old age (non-contributory) pensions and 209,862 for persons claiming pensions under the Old Age Contributory Pensions Acts, 1925 and 1929; 195,622 for verification purposes in connexion with claims to widows' and orphans' pensions under the Widows', Orphans', etc., Acts, 1925 and 1929; 24,539 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; 25,336 for verification of age, etc., in connexion with National Health and Unemployment Insurance; and 10,359 for other public purposes.

Offences against the Registration Acts.—In 1931 twenty-six 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 .. .. .	2
(c) Giving false information when registering a birth or death .. .. .	13
(d) Giving false information for the purpose of procuring marriage .. .. .	7

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 1931, authority was issued for the re-registration of the births of 3,511 children, being 478 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:—

	1927.	1928.	1929.	1930.	1931.
March quarter ..	1,265	1,401	1,075	996	981
June quarter ..	1,256	1,170	1,105	1,001	908
September quarter ..	1,381	1,242	933	1,006	797
December quarter ..	1,593	1,070	933	986	825
Totals .. ..	5,495	4,883	4,046	3,989	3,511

#### 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 1931, is 4,127, the following



table furnishing an analysis of the Adoption Orders made by reference to the several classes of Courts and the quarterly distribution of the total figure.

Table LXXXIX.

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

#### 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, 1931.

The particulars have been taken from statements furnished to the Registrar-General by the Registration Officers of the several 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 number 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.

Table XC.—England and Wales.—  
Parliamentary and Local Government Electors.

Register.	Parliamentary Register (including University Constituencies).					Local Government Register.		
	Persons.	Males.	Females.	Business Premises Qualifications. Males only up to 1928. Persons from 1929 (included in Cols. b-d).	Persons on Absent Voters List (included in Cols. b-d).	Persons.	Males.	Females.
<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>k</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	7,558,440	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	7,700,108	7,622,517
1923 "	18,388,833	10,498,179	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	10,837,545	8,269,730	217,509	167,406	16,345,290	8,157,607	8,137,683
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	11,866,794	13,228,999	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

The figures for the whole country are summarised in Table XC and are shown in conjunction with the figures of previous Registers made since the passing of the 1918 Act.

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  $1\frac{1}{4}$  millions 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 26,135,944 represents 65·4 per cent. of the estimated total population, or 64·1 per cent. of the male and 66·5 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 47·9 per cent. of the whole population, or 47·2 per cent., and 48·6 per cent. in the case of males and females separately.

Of the total of the Parliamentary Registers, the bulk, viz., 26,048,834, represents the aggregate voting strength in the 509 geographical constituencies into which England and Wales is divided, the balance of 87,110 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 50,094 per member and eight in respect of the Universities, with an average electorate of 10,889.

#### 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 as follows:—

Table W, showing the Population, Births, Deaths, Infant Mortality and Marriages, with Rates in British Islands and Dominions, 1931.

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 1931

##### ENGLAND AND WALES

The year under review was chiefly remarkable for the excessive wetness and dullness of its summer half, April to September, inclusive, which, with almost one and one-half times the average rainfall over the country as a whole, was the wettest experienced for at least half a century with only one exception, viz., the summer of 1924 which was about equally wet. Severe flooding occurred in many parts of the country during the months May to August, during the early days of September and in November. March was

the only month in which there was a general and pronounced deficiency of rainfall; in the Midlands and the east of England the rainfall for March was less than one-fifth of the average. A marked deficiency was also recorded in October and December. September was mostly dry, although unusually heavy falls during the first few days resulted in an excess over the average in the Midlands and the North. For the year as a whole the general precipitation was about 8 per cent. above the normal as compared with an excess of 17 per cent. in 1930.

No less remarkable than its excessive wetness was the dullness of the summer half and particularly the months April, July and September. January, March and October were the only months with a conspicuous and general excess of sunshine. Annual aggregates were everywhere below the average, the deficiency amounting to some 10 per cent. in the Midland Counties and England south-west.

Except for low temperatures during the first half of January and in March, conditions during the winter months were mild. During the summer half of the year the comparative lack of sunshine and the prevalence of winds from a northerly or easterly point resulted in the days being frequently cool. In several places monthly mean temperatures were below the normal by 2° F. or 3° F. in August and by 3° F. or 4° F. in September. Annual means were about normal. There was a conspicuous absence of any really hot weather. Maximum temperatures of 80° F. and over were recorded on June 14th and 28th in London and parts of Kent, on July 12th at Shoeburyness and in London, and in several places in Great Britain even as far north as Achnashellach (Ross and Cromarty) on August 3rd, 4th or 5th. The highest reported temperature was 83° F. at Bromley (Kent) on June 14th and the lowest 5° F. at Rickmansworth on March 10th. Amongst some remarkably low temperatures recorded during March by the grass minimum thermometer were -3° F. at Rickmansworth (Herts) and -1° F. at Lympne (Kent) on the 10th. In December, temperature reached the remarkably high level of 60° F. in parts of England on the 4th.

**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.



## REGISTRAR-GENERAL FOR SCOTLAND

SEVENTY-EIGHTH ANNUAL REPORT FOR 1932. Price 3s. 6d. (3s. 10d.)

### CENSUS 1931 :—

PRELIMINARY REPORT. Price 3s. (3s. 2d.)

REPORT ON THE FOURTEENTH DECENNIAL CENSUS, Vol. I :—

Part. CITY OF	Part. COUNTY OF
1. Edinburgh. Price 2s. (2s. 2d.)	18. Inverness. Price 2s. 6d. (2s. 8d.)
2. Glasgow. Price 2s. 3d. (2s. 5d.)	19. Kincardine. Price 2s. (2s. 2d.)
3. Dundee. Price 1s. 6d. (1s. 7d.)	20. Kirkcudbright. Price 2s. (2s. 2d.)
4. Aberdeen. Price 1s. 6d. (1s. 7d.)	21. Lanark. Price 3s. (3s. 2d.)
COUNTY OF	
5. Aberdeen. Price 2s. 6d. (2s. 8d.)	22. Midlothian. Price 2s. (2s. 2d.)
6. Angus. Price 2s. (2s. 2d.)	23. Moray and Nairn. Price 3s. (3s. 2d.)
7. Argyll. Price 2s. 6d. (2s. 8d.)	24. Orkney. Price 2s. (2s. 1d.)
8. Ayr. Price 3s. (3s. 2d.)	25. Peebles. Price 1s. 6d. (1s. 7d.)
9. Banff. Price 2s. (2s. 1d.)	26. Perth and Kinross. Price 3s. 6d. (3s. 8d.)
10. Berwick. Price 1s. 6d. (1s. 7d.)	27. Renfrew. Price 2s. 6d. (2s. 8d.)
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