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**MORTALITY FROM INFLUENZA IN IRELAND.**

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[*Read November 14th, 1919.*]

Since the period of the Great Famine ("The Black Forty-seven"), with its awful attendant horrors of fever and cholera, no disease of an epidemic nature created so much havoc in any one year in Ireland as Influenza in 1918, for during that year, out of a total of 78,695 deaths from all causes registered no less than 10,651 deaths, or 13.5 per cent., were ascribed to this cause.\*

Stated in terms of the population, it would appear that the 10,651 deaths from influenza are equivalent to 243 per 100,000 inhabitants.

When comparison is made with the number for 1917—viz., 1,438, or with the annual average for the ten years, 1908-17—viz., 1,234, or even with the highest annual number recorded prior to 1918—viz., 4,677 in 1900—an idea will be formed as to the extent of the ravages of influenza in 1918.

Furthermore, deaths from pneumonia, which numbered 4,111 in 1917, rose to 6,120 in 1918, showing an increase of 2,009 deaths, and as pneumonia was closely associated with the epidemic of influenza, it may, I think, be fairly assumed that an appreciable number of deaths in 1918 classified to pneumonia were in reality cases of influenza,

\* It has been ascertained that the number of fatal cases attributed to influenza in Ireland as registered during the quarter ended 31st March, 1919, was 5,716 (deaths of males numbering 3,020 and of females 2,696), so that for the fifteen months ended 31st March last 15,867 deaths, in which influenza was returned as a cause of death, were registered.

although not so stated in the medical certificates.\* Further reference will be made to this aspect of the case.

The following table gives the mortality from influenza for each year from 1864 (the first year of the operation of the Act for the Registration of Deaths in Ireland) to the year 1918:—

TABLE I.—Showing the number of deaths from Influenza registered in Ireland during each of the fifty-five years, 1864-1918, with the mortality per 100,000 of the population.

DEATHS FROM INFLUENZA.					
YEAR.	Number.	Rate per 100,000 of Population.	YEAR.	Number.	Rate per 100,000 of Population.
1865 ...	220	4	1893 ...	1,310	28
1866 ...	189	3	1894 ...	2,032	44
1867 ...	164	3	1895 ...	1,896	42
1868 ...	96	2	1896 ...	729	16
1869 ...	180	3	1897 ...	1,535	34
1870 ...	166	3	1898 ...	2,277	50
1871 ...	105	2	1899 ...	1,716	38
1872 ...	132	3	1900 ...	4,677	105
1873 ...	100	2	1901 ...	1,381	31
1874 ...	100	2	1902 ...	1,258	28
1875 ...	124	2	1903 ...	1,553	35
1876 ...	121	2	1904 ...	1,184	27
1877 ...	93	2	1905 ...	1,219	28
1878 ...	54	1	1906 ...	978	22
1879 ...	74	1	1907 ...	1,720	39
1880 ...	69	1	1908 ...	1,798	41
1881 ...	54	1	1909 ...	1,303	30
1882 ...	39	1	1910 ...	1,332	30
1883 ...	87	2	1911 ...	992	23
1884 ...	43	1	1912 ...	1,025	23
1885 ...	36	1	1913 ...	1,174	27
1886 ...	34	1	1914 ...	696	16
1887 ...	26	1	1915 ...	1,568	36
1888 ...	44	1	1916 ...	1,014	23
1889 ...	21	0	1917 ...	1,438	33
1890 ...	1,712	36	1918 ...	10,651	243
1891 ...	891	19			

\* In 4,378 instances, out of a total of 5,716 deaths ascribed to influenza during the quarter above referred to, one or more diseases were stated in the medical certificates to be associated with influenza, and in 1,338 cases influenza merely was given as the cause of death.

Of the 4,378 cases in which a cause secondary to influenza was returned, as many as 3,065 were stated to be deaths from influenza associated with pneumonia.

This table shows that from 1864 to the end of 1889 the deaths from influenza varied from the comparatively small number of 311 for the former year to 21 for the latter, the average annual number for the whole of that period being only 103. An outbreak of influenza in 1890, however, brought the number up to 1,712, or 36 in every 100,000 inhabitants, followed by 891 (or 19 per 100,000) in 1891, and by 3,742 (or 81 per 100,000) in 1892.

During the next seven years the deaths varied from 729 in 1896 to 2,277 in 1898. Two years later, in 1900, the number of deaths registered as from influenza was 4,677, or 105 in every 100,000 of the population, being the highest annual mortality from this cause recorded for Ireland in the years preceding 1918; but, as will be observed, this mortality is far below that recorded for last year.

As further illustrating the extent of the ravages of the recent epidemics, a comparison is instituted between the fatal cases of influenza in 1918, and the highest mortality since the year 1864 from other diseases of an infectious nature. The facts are given in the following table:—

TABLE II.—Showing the Highest Mortality from Principal Epidemic Diseases during the period 1864-1918, as compared with that from Influenza in 1918.

CAUSE OF DEATH.	Year.	Number of Deaths.	Rate per 100,000 of Population.
Enteric Fever ...	1898	1,284	28
Typhus ...	1880	934	18
Small-pox ...	1872	3,248	61
Measles ...	1878	2,212	42
Scarlet Fever ...	1874	4,034	76
Whooping-cough	1868	2,380	44
Diphtheria ...	1874	565	11
Influenza ...	1918	10,651	243

The highest mortality, apart from influenza, shown in the above table, viz., 4,034 deaths from scarlet fever (small-pox following with 3,248 deaths), is far below that recorded for influenza.

As has been already stated, registration of deaths by statutory enactment came into force in Ireland in 1864, and in Table I. the mortality from influenza is shown for each year from the earliest year of registration.

Information for decennial periods from 1831 to 1871 is, however, obtainable from the various reports of the Census

Commissioners; and although the figures may be open to question as regards their accuracy, still the Census figures and the Commissioners' observations thereon may be found interesting, if not instructive.

In the following statement deaths from influenza in Ireland are shown by decennial periods:—

Period.	No. of Deaths from Influenza.	Annual Average.	
1831-1841	10,575	1,056	} From Census Reports.
1841-1851	10,753	1,075	
1851-1861	14,484	1,448	
1861-1871	2,184	218	
1871-1880	972	97	} From Registrar General's Report.
1881-1890	2,096	210	
1891-1900	20,805	2,081	
1901-1910	13,726	1,373	
1911-1917	7,907	1,130	
1918	10,651	—	

The Census Commissioners of 1841 report under the heading, "Influenza":—"The deaths attributed to this disease amount to 10,575, as 100 males to 84·65 females; being 1 in 112·28 of the deaths from all causes, and 1 in 36·05 of those of the epidemic class, of which it is the 9th most fatal disease.

In the "Treatise of Ireland," by John Dymmok, written about the year 1600, we learn that "the inhabitants, but especially the sojourners there, be very subject to rheums, *cattars* and *fluxes*." Boate writes, that in the English armies, which were quartered in Ireland in 1641, and after, "were not only the looseness and the malignant fever wherof we have spoken above as of Ireland's reigning diseases, very common, but then besides several other infirmities—viz., *violent coughs* and of long continuance, *stopping of the breath*, called in Latin *Dispncea*."

For the first and best account of this "*leaguer sickness*" in Ireland we are indebted to Sir T. Molyneux, M.D., who described a "transient fever" of this description, accompanied with "*general epidemic, coughs and colds*," in 1688, and subsequently in 1693, when it was known to prevail over Europe generally.

Rutty witnessed an invasion of an universal epidemic, catarrh, in 1729, and again in 1737, when the weekly Bill of Mortality for Dublin rose to 144. The years 1762 and 1782 were likewise memorable for its attacks. Many

epizootic diseases of remarkable fatality have been recorded by authors, as appearing contemporaneously with influenza and other epidemics. A memorable instance of this kind is mentioned in 1751, and again in 1764. Although Influenza has been occasionally epidemic in Ireland for so long a period, no very violent outbreak occurred during the present century (19th) till the years 1833-34, and again with marked fatality in 1836-37, when, according to calculations made by Dr Graves, "we may conclude that in Dublin alone more than 4,000 people died of the Influenza, not taking into account the greater number who, although they got over the immediate attack of the epidemic, sank afterwards under various diseases of which Influenza laid the foundation."

This calculation, although far above what we may suppose was the actual mortality from this cause, serves to mark the violence of the epidemic which then raged.

The Census returns exhibit a remarkable increase of deaths from this disease in the latter year (1837), being 509 males and 363 females.

The mortality from this cause does not seem to have been much influenced by locality, having prevailed almost equally in the civic and rural districts; the deaths under this head were 1 in 81.16 in Leinster; 1 in 99.45 in Munster; 1 in 207.72 in Ulster; and 1 in 135.9 in Connaught. It is not, however, a disease so well or generally known to the people as others of the same class. It is described in the MSS. under the term *Fuacht*, as well as *Slaodan*, which is mentioned in the Annals of the Four Masters as epidemic in Ireland in the 14th century; and also *Creatan*, probably from *Creat*, the thorax, in which latter sense it is understood to be incidental to old age.

It has prevailed at all ages from one month to 90 years."

#### *Mortality in Great Britain.*

The total number of deaths of civilians in England and Wales classified to Influenza during the year 1918 amounted to 104,738, being equivalent to a rate of 313 per 100,000 of the estimated civilian population.

Deaths assigned to this cause in Scotland during the year 1918 numbered 10,923 (from January to June 128,\* and from July to December 10,795). During the ten months from July, 1918, to April, 1919, the number of

\* Not including deaths in which influenza was one of two or more named causes. In the second half of 1918 all influenza deaths are included.

deaths attributed to influenza in Scotland amounted to 17,575, affording an annual rate of 432 in every 100,000 of the population. It will be understood that the figures for Scotland, above referred to, are not comparable with those for Ireland or for England and Wales.

*Mortality in Ireland by Sexes and by Localities.*

Of 10,651 deaths in Ireland in 1918 (or 243 per 100,000 of the population), 5,591 were those of males and 5,060 of females. This information by territorial divisions is shown in the following Table:—

TABLE III.—Showing, by Sexes, the number of deaths from Influenza registered in each county and county borough in Ireland during the year 1918, with the respective rates per 100,000 of the population.

COUNTY, &c.	DEATHS FROM INFLUENZA.			
	Males.	Females.	Total.	Rate per 100,000 of Population.
Carlow ... ..	64	53	117	323
Dublin ... ..	272	255	527	306
Kildare ... ..	156	107	263	395
Kilkenny ... ..	95	82	177	237
King's ... ..	67	31	98	172
Longford... ..	34	40	74	169
Louth ... ..	84	76	160	251
Meath ... ..	78	49	127	195
Queen's ... ..	57	48	105	192
Westmeath ... ..	64	35	99	165
Wexford ... ..	189	159	348	340
Wicklow ... ..	123	77	200	329
Clare ... ..	31	17	48	46
Cork ... ..	281	188	469	149
Kerry ... ..	93	57	150	94
Limerick ... ..	105	116	221	211
Tipperary, N.R. ... ..	72	71	143	227
Tipperary, S.R. ... ..	96	84	180	201
Waterford ... ..	39	39	78	138
Antrim ... ..	232	215	447	230
Armagh ... ..	221	226	447	372
Cavan ... ..	93	64	157	172
Donegal ... ..	258	267	525	312

TABLE III.—*continued.*

COUNTY, &c.	DEATHS FROM INFLUENZA.			
	Males	Females.	Total.	Rate per 100,000 of Population.
Down ... ..	338	337	675	330
Fermanagh ... ..	36	32	68	110
Londonderry ... ..	119	131	250	249
Monaghan ... ..	125	103	228	319
Tyrone ... ..	168	144	312	219
Galway ... ..	143	120	263	144
Leitrim ... ..	39	24	63	99
Mayo ... ..	97	73	170	88
Roscommon ... ..	59	42	101	107
Sligo ... ..	70	30	100	127
<i>County Boroughs :</i>				
Dublin ... ..	630	610	1,240	406
Belfast ... ..	688	826	1,514	385
Cork ... ..	71	55	126	164
Londonderry ... ..	75	75	150	375
Limerick ... ..	79	48	127	330
Waterford ... ..	50	54	104	379
Total of County Boroughs.	1,593	1,668	3,261	370
Remainder of Ireland.	3,998	3,392	7,390	211
<i>Provinces :</i>				
LEINSTER ... ..	1,913	1,622	3,535	304
MUNSTER ... ..	917	729	1,646	159
ULSTER ... ..	2,353	2,420	4,773	302
CONNAUGHT ... ..	408	289	697	114
IRELAND ... ..	5,591	5,060	10,651	243

The foregoing table shows that, while the deaths for each sex applicable to the whole country do not differ to any appreciable extent, being in the proportion of 100 males to 91 females, the deaths of females in the province of Ulster exceed those of males, the 1,514 deaths in Belfast

county borough alone comprising 826 of females and 688 of males from influenza. Doubtless the extensive employment of females in the factories and workshops of Belfast would account for the excess in the female mortality. In the provinces of Leinster, Munster and Connaught the deaths of males are decidedly higher than those of females. In the year 1900, during which a high mortality from influenza was recorded, as also in 1892, the deaths of females from this cause exceed those of males. (Table V.)

Table III. also shows that the highest rate for any county or county borough area is 406 per 100,000 of the population for Dublin county borough, Kildare following with 395 per 100,000; Belfast county borough, 385; Waterford county borough, 379; Londonderry county borough, 375; and Armagh county, 372 per 100,000 of the population. The six counties having the lowest rates per 100,000 of the population were: Clare (46), Mayo (88), Kerry (94), Leitrim (99), Roscommon (107), and Fermanagh (110).

The rate for the province of Leinster was 304 per 100,000; for Ulster, 302; for Munster, 159; and for Connaught, 114.

#### *Excess of Deaths from Pneumonia.*

It has been suggested that a large proportion of the heavy mortality assigned to pneumonia in 1918, during which year the deaths from this cause outnumbered those in 1917 by more than 2,000, should be considered as influenza cases, although not returned as such in the medical certificates.

The following Table gives an analysis of this excess mortality:—

[TABLE IV.]



TABLE IV.—Showing, by counties, etc., the mortality from Pneumonia in Ireland during the year 1918, as compared with 1917.

COUNTY, &c.	DEATHS FROM PNEUMONIA.			
	Number in 1917.	Number in 1918.	Rate per 100,000 of Population in 1918.	Increase (+) or Decrease (—) in rate for 1918 as compared with 1917.
Carlow ... ..	34	25	69	— 25
Dublin ... ..	171	308	178	+ 79
Dublin Co. Borough	513	985	323	+ 155
Kildare ... ..	61	98	147	+ 55
Kilkenny ... ..	38	59	79	+ 28
King's ... ..	46	58	102	+ 21
Longford... ..	18	32	73	+ 32
Louth ... ..	56	85	134	+ 46
Meath ... ..	54	103	158	+ 75
Queen's ... ..	31	54	99	+ 42
Westmeath ... ..	27	62	103	+ 58
Wexford ... ..	88	119	116	+ 30
Wicklow ... ..	42	59	97	+ 28
Clare ... ..	72	74	71	+ 2
Cork Co. and Co Boro'	384	510	130	+ 32
Kerry ... ..	116	139	87	+ 14
Limerick Co. and Co. Boro'.	105	191	134	+ 61
Tipperary, N.R. ...	35	36	57	+ 1
Tipperary, S.R. ...	89	120	134	+ 35
Waterford Co. and Co. Boro'.	85	64	76	— 25
Antrim ... ..	181	240	124	+ 31
Armagh ... ..	126	151	126	+ 21
Belfast Co. Boro'	594	1,063	270	+ 119
Cavan ... ..	99	107	117	+ 8
Donegal ... ..	104	163	97	+ 35
Down ... ..	230	215	105	— 8
Fermanagh ... ..	62	70	113	+ 13
Londonderry Co. and Co. Boro'.	104	283	202	+ 128
Monaghan ... ..	47	78	109	+ 43
Tyrone ... ..	112	170	119	+ 40
Galway ... ..	148	166	91	+ 10
Leitrim ... ..	34	35	55	+ 2
Mayo ... ..	141	125	65	— 8
Roscommon ... ..	36	37	39	+ 1
Sligo ... ..	28	36	46	+ 11

TABLE IV.—*continued.*

COUNTY, &c.	DEATHS FROM PNEUMONIA.			
	Number in 1917.	Number in 1918.	Rate per 100,000 of Population in 1918.	Increase (+) or Decrease (—) in rate for 1918 as compared with 1917.
<i>Provinces :</i>				
LEINSTER ...	1,179	2,047	176	+ 75
MUNSTER ...	886	1,134	110	+ 24
ULSTER ...	1,659	2,540	161	+ 56
CONNAUGHT ...	387	399	65	+ 2
IRELAND ...	4,111	6,120	140	+ 45

As shown in the foregoing table, the excess figures for Dublin county borough (155 per 100,000), for Londonderry county and county borough (128), for Belfast county borough (119) and Dublin county (79) are rather remarkable. If it be accepted that the deaths in question were in reality due to influenza, these areas, and especially Dublin, paid a heavy toll to the great epidemic.

#### *Ages at Death.*

The rates per 100,000 of the population at each age-period represented by deaths from influenza in 1918 were as follows:— Under 5 years, 295; 5-10 years, 120; 10-15 years, 103; 15-20 years, 228; 20-25 years, 329; 25-35 years, 380; 35-45 years, 239; 45-55 years, 222; 55-65 years, 226; 65-75 years, 221; and for persons aged 75 years and upwards, 256 per 100,000 of the population at this age-period, the rate for the whole country at all ages being 243.

The distribution of deaths by age-periods and the proportion at each of the nine age-periods selected are shown in the next Table for the year 1918, as compared with 1900 and 1892, years during which the highest mortality from influenza in the years preceding 1918 was recorded for Ireland.

TABLE V.—Showing, by sexes and age-periods, the number of deaths from Influenza registered in Ireland during the year 1918, as compared with 1900 and 1892, with the proportion per cent. of the deaths at each age-period.

YEAR.	SEX.	DEATHS FROM INFLUENZA AT AGE PERIODS.									
		Under 5 Years.	5-15.	15-25.	25-35.	35-45.	45-55.	55-65.	65-75.	75 and upwards	Total All Ages.
1918	Males.	625	431	1,205	1,390	706	448	317	321	148	5,591
1900		257	64	86	92	122	202	418	528	437	2,206
1892		306	75	97	86	112	198	305	358	294	1,831
1918	Females	621	533	997	1,032	579	427	321	373	177	5,060
1900		238	69	106	78	103	257	534	622	464	2,471
1892		241	93	122	85	98	204	357	417	294	1,911
1918	Males. and Females	1,246	964	2,202	2,422	1,285	875	638	694	325	10,651
1900		495	133	192	170	225	459	952	1,150	901	4,677
1892		547	168	219	171	210	402	662	775	588	3,742
PROPORTION PER CENT. OF TOTAL DEATHS.											
1918	Males.	11·2	7·7	21·6	24·8	12·6	8·0	5·7	5·8	2·6	100·
1900		11·8	2·8	3·9	4·2	5·5	9·2	18·9	23·9	19·8	100·
1892		16·7	4·1	5·3	4·7	6·1	10·8	16·7	19·6	16·0	100·
1918	Females	12·3	10·5	19·7	20·4	11·4	8·4	6·4	7·4	3·5	100·
1900		9·6	2·8	4·3	3·2	4·2	10·4	21·6	25·2	18·7	100·
1892		12·5	4·9	6·4	4·5	5·1	10·7	18·7	21·8	15·4	100·
1918	Males and Females	11·8	9·0	20·7	22·7	12·1	8·2	6·0	6·5	3·0	100·
1900		10·6	2·8	4·1	3·6	4·8	9·8	20·4	24·6	19·3	100·
1892		14·6	4·5	5·8	4·6	5·6	10·7	17·7	20·7	15·8	100·

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This table shows the very high percentage of deaths at the ages between 15 and 45 years in 1918 as compared with the facts for other years selected as having a high mortality rate from this disease, and the markedly low percentage of deaths of persons 45 years and upwards, especially the proportion of persons 55 and upwards.

No less than 55·5 per cent. of all the deaths from influenza in 1918 were those of persons 15 and under 45 years of age, as compared with 12·5 per cent. for 1900 and 16·0 per cent. for 1892. Deaths of persons 45 years and upwards in 1918 were equivalent to 23·7 per cent. of the total deaths from influenza in that year, those at 55 years and over being only 15·5 per cent. In 1900 the percentage of deaths at 45 years and upwards was 74·1, the percentage at 55 and upwards being 64·3, and in 1892, deaths at 45 years of age and upwards were 64·9 per cent. of the total, deaths at 55 and upwards being equivalent to 54·2 per cent. of all the deaths from influenza registered during that period.

Of the deaths from influenza in 1918, 11·8 per cent. were those of children under 5 years of age, the percentage of such deaths for 1900 and 1892 being 10·6 and 14·6, respectively.

The marked difference between the relative frequency of deaths from influenza in 1918 at the several age-periods and the deaths from all causes in 1917 at the same age-periods is exemplified in Table VI. Figures are also given for the years 1900 and 1892, in addition to particulars regarding pneumonia.

[TABLE VI.

TABLE VI.—Showing a comparison of the age distribution relating to deaths from Influenza and Pneumonia registered in Ireland during the year 1918, with deaths from the same causes in 1902 and 1892, and with deaths from all causes in a normal year, taken as 1917.

YEAR.	Cause of Death.	PROPORTION PER CENT. OF DEATHS AT AGE-PERIODS.									Total.
		Under 5 Years.	5-15.	15-25.	25-35.	35-45.	45-55.	55-65.	65-75.	75 and over.	
1918	Influenza.	11·8	9·0	20·7	22·7	12·1	8·2	6·0	6·5	3·0	100·
1900		10·6	2·8	4·1	3·6	4·8	9·8	20·4	24·6	19·3	100·
1892		14·6	4·5	5·8	4·6	5·6	10·7	17·7	20·7	15·8	100·
1918	Pneumonia.	28·8	7·1	11·6	13·0	8·7	8·4	8·1	9·2	5·1	100·
1900		23·5	4·1	5·7	7·8	10·8	11·7	16·4	12·8	7·2	100·
1892		17·4	5·3	6·7	7·0	9·9	14·2	17·9	13·8	7·8	100·
1917	All Causes	15·8	3·4	5·5	5·6	6·7	8·2	11·0	19·6	24·2	100·

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The peculiarity regarding the influenza figures shown in above table has been already commented upon in contrast with those for 1900 and 1892.

It will be seen from the Table that the percentages for pneumonia at the several age-periods in 1900 and in 1892 show a rather close similarity, and up to 35 years of age there does not appear to be any very material difference between the relative frequency of deaths from pneumonia in each of those years and deaths from all causes in 1917, selected as a normal year. The distribution of the deaths from pneumonia in 1918 follows a markedly different course and much more in line with the influenza figures for that year, thus affording further evidence in support of the view that many of the deaths returned as from pneumonia were in reality deaths from influenza.

In conclusion it may be considered worthy of note that if the mortality from influenza in 1918 had only reached the normal, the number of deaths from other causes being the same as is shown in my Annual Report, a record for low mortality in Ireland would have been the result.