A STUDY OF THE TREND OF MORTALITY RATES IN URBAN COMMUNITIES OF ENGLAND AND WALES

WITH SPECIAL REFERENCE TO DEPRESSED AREAS

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In a report shortly to be published by the Ministry of Health the problem of the relation of the economic depression of 1928-33 to the death rate of the population of the depressed areas has been minutely examined. In view of the possibility of some delay in publication it has been suggested that a short summary of the investigation—indicating briefly the method of approach, the principal results, and the main evidence which forms the basis of the conclusions—might be of general interest. For detailed analysis the reader is referred to the complete report when published.

Mortality statistics derived from the publications of the General Register Office, whatever their limitations, still remain the best index of the health of the general population we possess. They were therefore used in this study, the main object of which was to determine whether in the depressed areas the years of depression could be shown to have exerted a deleterious effect on the mortality experience, demonstrable by establishing the existence either of a greater excess in their death rates over those of the country as a whole than was recorded in years previous to the depression, or of a slower rate of decline since the depression began than has been apparent in other and more prosperous parts of the country.

Two methods of approach to the problem were adopted: comparison of (a) standardized death rates of all causes of death for the three triennial periods 1911-13, 1920-2, and 1930-2, and (b) of annual death rates in specific age groups from 1911 to 1934, with similar rates for certain towns in the country less severely affected by the depression and with the rates for England and Wales as a whole. The analysis of annual death rates was restricted to towns where no changes in boundary had occurred throughout the period.

My definition of the depressed areas is that generally adopted—namely, for England, the counties and county boroughs of Lancashire, Cheshire, Northumberland, and Durham; and for South Wales the counties and county boroughs of Glamorgan, Monmouth, Brecknockshire, and Carmarthenshire.

In making a selection of prosperous county boroughs I had recourse to a list of unemployment rates which, calculated for other purposes from data provided by the Ministry of Labour, related in all to sixty-eight county boroughs from all parts of the country, depressed as well as prosperous. These unemployment rates were for the triennium 1927-9 and referred to males only. From this list I first excluded all north of Lincoln and also seaside and holiday resorts; from the remainder I selected those whose unemployment rate was below the mean of the sixty-eight boroughs. In addition, I have included the administrative county of London.

Standardized Mortality Rates, 1911-13, 1920-2, 1930-2

These rates are given for each of the northern counties and for the four Welsh counties as a whole in Table I. They show progressive decline in each successive triennium. Similar rates (omitted here) were calculated for every county borough within these areas, and with but two exceptions (where the 1920-2 rate was the lowest) the same feature was apparent.

Rates calculated in precisely the same manner but relating to the prosperous group of towns are given in

Table II, and in this group, as in the depressed areas, mortality has declined during the last two decades in every case examined. In each county borough, for both sexes, the standardized rates show a fall in 1920-2 and another fall in 1930-2. Thus absolute rates of mortality declined progressively from 1911-13 without serious check by reason of the economic depression.

TABLE I.—All Causes. Standardized Death Rates per 1,000

	Males			Females		
	1911-13	1920-2	1930-2	1911-13	1920-2	1930-2
England and Wales ..	15.08	12.84	11.01	12.49	10.50	8.78
County of Lancashire* ..	18.85	15.58	13.20	15.61	12.71	10.50
County of Cheshire* ..	15.82	12.99	11.16	12.82	10.57	8.65
County of Northumberland*	16.18	14.70	12.03	14.13	11.12	9.91
County of Durham* ..	17.44	15.70	12.96	15.41	13.61	10.98
South Wales† ..	15.84	13.67	12.00	13.93	11.88	10.20

* Administrative county together with associated county boroughs.

† Geographical counties of Brecknock, Carmarthen, Glamorgan, and Monmouth.

TABLE II.—Showing the Standardized Rates of Mortality per 1,000 for certain County Boroughs outside the Depressed Areas

District	Males			Females		
	1911-13	1920-2	1930-2	1911-13	1920-2	1930-2
England and Wales ..	15.08	12.84	11.01	12.49	10.50	8.78
Bath ..	11.85	10.93	9.11	8.30	7.75	6.74
Birmingham ..	15.66	13.75	11.59	13.00	10.78	8.91
Canterbury ..	12.83	9.87	9.24	10.28	8.71	7.45
Coventry ..	14.82	11.92	11.12	12.90	9.60	8.66
Derby ..	14.16	12.08	10.90	12.25	9.72	8.71
Exeter ..	15.02	11.81	10.52	12.51	10.23	7.10
Gloucester ..	14.43	12.11	10.40	11.77	10.85	8.86
Ipswich ..	14.73	10.91	9.32	11.52	9.75	8.05
Leicester ..	15.42	13.67	11.23	12.67	11.23	8.83
Lincoln ..	14.55	13.17	10.33	11.99	9.52	8.74
Northampton ..	14.01	11.96	9.84	11.79	8.83	8.51
Norwich ..	14.32	11.91	9.67	11.36	9.69	7.58
Nottingham ..	16.69	14.16	12.55	14.09	11.64	9.62
Oxford ..	12.74	10.35	9.09	9.45	8.20	7.35
Reading ..	13.75	10.76	9.75	11.07	8.74	7.74
Worcester ..	14.15	12.40	11.30	11.77	9.40	8.66
London ..	16.30	14.11	11.71	12.76	11.02	8.71

But while in the depressed areas in only three out of thirty-two boroughs was the rate *lower* than that of England and Wales in *any* of the three periods examined, in the prosperous group only three out of seventeen show mortality *higher* than that of England and Wales for both sexes at each of the triennial periods, and even in these the amount of excess is slight compared with that experienced by the boroughs in the depressed districts. This is seen by reference to Tables III and IV, in which the rates for every county and county borough examined are expressed as percentages of the rate for England and Wales.

From Table III it is also seen that in only two (Lancashire and Durham) out of the five geographical counties can the death rate in 1930-2 be said to have been approximately 20 per cent. higher than that of the whole country. The three remaining depressed districts show much less excess. Furthermore, Lancashire and Cheshire were both in a better position relative to England and Wales in 1930-2 than they were in 1911-13. If the country as a whole has improved from the point of mortality, as we know it has, those two counties have improved to a still greater extent. In the other three districts the relative improvement has not quite kept level with that in England and Wales, since in each there was 2 or 3 per cent. more excess in 1930-2 than existed in 1911-13.

Thus whilst it is true that the depressed areas have death rates in excess of England and Wales it is not true

that this excess is a consequence of the post-war depression of 1928-33. On the contrary, it appears that these counties have in the last twenty years kept pace with the country as a whole as regards the decline in general mortality. The excess has been in existence for at least the last twenty years and has been nearly constant.

TABLE III.—Standardized Death Rates from all Causes for certain Depressed Districts expressed as a percentage of the Standardized Death Rate of England and Wales

	Males			Females		
	1911-13	1920-2	1930-2	1911-13	1920-2	1930-2
England and Wales ..	100	100	100	100	100	100
County of Lancashire* ..	125	121	120	125	121	120
Barrow-in-Furness ..	111	105	111	112	101	110
Blackburn ..	122	125	110	124	124	117
Bolton ..	125	121	114	124	125	119
Bootle ..	140	127	133	137	127	133
Blackpool ..	107	76	107	100	77	99
Burnley ..	131	137	115	141	138	121
Bury ..	118	122	112	116	118	120
Liverpool ..	144	137	135	142	134	129
Manchester ..	134	131	129	128	125	123
Oldham ..	136	137	127	134	137	132
Preston ..	134	123	123	134	126	122
Rochdale ..	120	123	120	123	128	124
St. Helens ..	139	127	124	146	129	124
Southport ..	79	91	97	72	79	95
Salford ..	135	131	138	132	130	132
Warrington ..	122	118	129	128	117	123
Wigan ..	144	140	135	147	143	145
County of Cheshire* ..	105	101	101	103	101	99
Birkenhead ..	120	118	118	113	115	115
Chester, City of ..	114	115	127	108	109	109
Stockport ..	124	116	115	122	113	109
Wallasey ..	created 1/4/13	94	96	created 1/4/13	94	87
County of Northumberland* ..	107	114	109	113	106	113
Newcastle-on-Tyne ..	121	131	123	120	130	121
Tynemouth ..	116	128	115	124	121	113
County of Durham* ..	116	122	118	123	130	125
Darlington ..	created 1/5/15	115	104	created 1/5/15	110	107
Gateshead ..	120	133	126	124	138	135
West Hartlepool ..	121	131	128	125	127	117
South Shields ..	134	140	138	132	141	138
Sunderland ..	128	138	132	128	136	135
South Wales† ..	106	107	109	113	114	116
Merthyr Tydfil ..	114	118	123	126	128	145
Newport ..	104	108	111	107	110	110
Swansea ..	114	110	107	119	109	112
Cardiff ..	111	114	113	109	109	107

* Administrative county together with associated county boroughs.

† Geographical counties of Brecknock, Carmarthen, Glamorgan, and Monmouth.

Transferring attention from the counties as a whole to individual county boroughs, it may be briefly mentioned here that the exceptionally favourable position of Blackpool, Southport, and Wallasey is shown in the report to be due mainly to the fact that they are better-class residential areas than other boroughs in the depressed areas. Omitting these, therefore, it is found that out of the remaining twenty-nine boroughs there was greater excess male mortality in 1930-2 than in 1911-13 in ten cases and of female mortality in ten cases also. But the excess of mortality in 1930-2 was greater than that of 1920-2 in only seven cases as regards either male or female mortality.

Even among the prosperous county boroughs of the South places can also be found whose position relative to England and Wales with regard to mortality has worsened (see Table IV).

Generally it may be said that in 1911-13 the boroughs of Lancashire had the highest male mortality, which was 44 per cent. in excess in Liverpool and Wigan. The tendency appears to have been for Lancashire to improve relatively, its place being taken by Durham. The highest male mortality in 1930-2 is found in South Shields, bracketed with Salford with 38 per cent. excess.

As regards female mortality, the most noteworthy point is the case of Merthyr Tydfil with 26 per cent. excess in 1911-13, 28 per cent. in 1920-2, but increased to 45 per cent. excess in 1930-2. Detailed analysis of this increase shows it to be due to increase in tuberculosis of the respiratory system, and of "other tuberculosis," to an increase in heart disease at ages 5 to 24 (particularly at ages 15 to 24), and to an epidemic of diphtheria, which in 1929-30 caused an increase in deaths of children between ages 5 and 14. I give evidence in my complete report in favour of the view that the increase in the rate of mortality from tuberculosis among females in Merthyr Tydfil is due to emigration of healthy young adult females between ages 15 and 24, with the result that on the average the weaker lives are left behind and the death rate increases.

TABLE IV.—Showing the Standardized Rates of Mortality per 1,000 for certain County Boroughs outside the Depressed Areas, expressed as a percentage of the Standardized Rates of England and Wales

District	Males			Females		
	1911-13	1920-2	1930-2	1911-13	1920-2	1930-2
England and Wales ..	100	100	100	100	100	100
Bath ..	79	85	83	66	74	77
Birmingham ..	104	107	105	104	103	101
Canterbury ..	85	77	84	82	83	85
Coventry ..	98	93	101	103	91	99
Derby ..	94	94	99	98	93	99
Exeter ..	100	92	96	100	97	81
Gloucester ..	96	94	94	94	103	101
Ipswich ..	98	85	85	92	93	92
Leicester ..	102	106	102	101	107	101
Lincoln ..	96	103	94	96	91	100
Northampton ..	93	93	89	94	84	97
Norwich ..	95	93	88	91	82	96
Nottingham ..	111	110	114	113	111	110
Oxford ..	84	81	83	76	78	84
Reading ..	91	84	89	89	83	88
Worcester ..	94	97	103	94	90	99
London ..	108	110	106	102	105	99

Annual Death Rates in Age Groups, 1911-34

The analysis in this section was limited to the following groups of county boroughs, these having experienced no changes in boundary during the period examined:

Northern Group + South Wales (Depressed Areas)		Southern Group (Prosperous Areas)
Bolton Oldham Salford Wigan	Principally textile	Gloucester Leicester Norwich Nottingham Ipswich London (Administrative County)
Bootle Newcastle Tynemouth West Hartlepool Merthyr Tydfil Newport	Shipping and heavy industries Coal mining and steel smelting	

Annual death rates from all causes of death, in ages 0-4, 5-14, 15-24, 25-44, 45-64, and over 65, were calculated for each of these groups for the years 1911-34, and compared with similar rates for England and Wales. It was evident that the only satisfactory means by which the salient points of such a mass of data could be made apparent was graphical representation on logarithmic scales. For the purpose of this article it must suffice to

note the principal deductions which were made from the diagrammatic comparison.

Over the period 1911-34 the general rate of mortality in England and Wales steadily declined, the fall being greatest at ages 0-4. At age group 5-14 the fall was not so great, at 15-24 it was very slight indeed, and at 25-44 somewhat faster again. At ages 45-64 a sudden fall occurred during the war years, the rates for some years before the war and since the war being roughly stationary. At ages over 65 the same phenomenon occurs, but the difference between the pre-war level and the post-war level is very much less in the older age groups.

With the exception of the Welsh group the graphs show that both in the depressed and in the prosperous areas the trend of mortality has been one of decline in proportion to the relation which each group bore to England and Wales in the years immediately preceding the war. The amount of excess or deficiency in mortality varies between the groups, but is roughly constant for each group throughout the period. South Wales is differentiated in

at both 1911-13 and 1920-2, falling to 22 per cent. in 1930-2, whilst for females the figures are 24, 22, and 21 per cent. in excess. With the exception of age group 15-44 it will be noted that the percentage for both males and females was slightly lower in 1930-2 than it was in 1911-13. The death rate in the depressed areas has fallen at a slightly slower rate at these ages than that of England and Wales as a whole. In the former the rates of 1930-2 were 77 and 78 per cent. of the 1911-13 figures for males and females respectively; in the country as a whole they were 75 and 77 per cent. It follows that the very slight deterioration in the relative position at these ages is due to a somewhat smaller fall in the rate of mortality in the depressed areas than occurred in England and Wales as a whole. This is the sole piece of evidence I can find in support of the view that there was a worsening of the position of the depressed areas in the years of the depression.

The greater excess mortality at the adult ages among females than among males is yet another phenomenon

TABLE V.—Showing the Death Rates in Age Groups in the Depressed Areas expressed as a percentage of the Death Rates of England and Wales

Age Group	1911-13			1920-2			1930-2		
	Death Rate in Depressed Areas per 1,000	Death Rate in England and Wales per 1,000	Percentage of England and Wales	Death Rate in Depressed Areas per 1,000	Death Rate in England and Wales per 1,000	Percentage of England and Wales	Death Rate in Depressed Areas per 1,000	Death Rate in England and Wales per 1,000	Percentage of England and Wales
Males :									
0-14	19.81	16.12	123	14.82	12.08	123	9.81	8.05	122
15-44	5.72	5.16	111	5.24	4.69	112	4.40	3.85	114
45-64	24.56	21.04	117	19.48	16.98	115	18.35	16.53	111
65+	96.88	87.62	111	86.75	79.74	109	86.39	80.63	107
All Ages ..	16.40	14.99	109	14.29	13.31	107	13.47	12.71	106
Females :									
0-14	16.95	13.67	124	12.11	9.92	122	7.87	6.49	121
15-44	5.00	4.32	116	4.59	3.98	115	3.90	3.33	117
45-64	19.64	16.16	122	15.22	12.89	118	13.75	11.97	115
65+	84.38	76.23	111	77.77	69.66	112	74.65	68.39	109
All Ages ..	14.48	13.16	110	12.39	11.60	107	11.74	11.24	104

that its mortality, which was but little in excess of the average before the war, increased in most age groups and remained stationary in others. Particularly is this true of female mortality. Thus the trend of mortality there has been upward and its position relative to England and Wales decidedly worse at the end of the period.

In the textile and heavy industry groups in the depressed areas excess mortality prevailed for both sexes at every age group throughout the period, but in South Wales only since the war. In the prosperous towns mortality has been roughly at the level of England and Wales as a whole. London can be classed with the prosperous group except at ages 25-44 and 45-64, where male mortality is found to have been consistently in excess of the general level.

Finally I combined all the counties and county boroughs of the depressed areas and calculated death rates in broad age groups for this aggregate depressed area for the three triennial periods 1911-13, 1920-2, and 1930-2, and compared the rates so found with the rates of England and Wales in the same age groups and for the same periods. The figures are given in Table V.

Broadly speaking the figures for 1930-2 show that in those years the excess mortality was greatest at the youngest age group, and also that among adult females the excess was greater than among males. But when attention is turned to the earlier triennial it becomes clear that the excess mortality in 1930-2 cannot be associated with the economic depression of that time. The two earlier periods show precisely the same type of relationship. At ages 0-14 the mortality of males in the depressed areas was 23 per cent. above the rates of England and Wales

which, though present in the depressed period, is found to have occurred at 1920-2 and 1911-13, and presumably has been present consistently throughout the period.

These results, it would seem, must lead to the conclusion that there is no evidence from the trend of mortality rates from all causes of death that the health of the population of the distressed areas has been unfavourably affected by the economic depression. Excessive mortality these areas certainly have, but this excess is not peculiar to the years of the depression. It has been a consistent feature of their mortality experience for at least the past twenty years.

Whilst on the one hand we may be inclined to regard this as a matter for congratulation, let us not overlook the fact that my analysis shows that we are concerned with a more deeply rooted evil, possibly involving genuine geographical and racial factors. The existence of evil conditions is not mitigated by reason of their having always been evil.

The preliminary programme of the Health Congress, to be held at Birmingham from July 12 to 17 by the Royal Sanitary Institute, has now been issued. The list of subjects to be discussed includes the development of the maternity service, care of the pre-school child, physical education, incapacitating sickness, health education, housing progress and prospects, safeguarding of bulk milk, and the value of medical services to industry. Lord Dudley is president of the congress, and the Minister of Health will address a general session.