*Aspects of the Impact of the First World War on Infant Mortality in Britain**

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Demographers, historians, and doctors have engaged in a number of inconclusive debates about the causes of mortality decline in Britain since the eighteenth century. Some have stressed nutritional improvements as decisive in the pattern of increasing resistance to infectious disease.[1] Others have pointed to medical or para-medical intervention as key components in the gradual lengthening of life expectation at birth.[2] A third set of writers has emphasized the importance for improvements in public health of the growth of state and local-authority support and supervision of health and welfare schemes and institutions.[3] Few suggest that any one factor is exclusively responsible for declining death rates,[4] but there is no consensus about the appropriate weight to be placed on the contribution of each.

This paper is an attempt to further the discussion of the causes of mortality decline, by a rigorous examination of one component of it, namely infant mortality decline in Britain in the period 1900-30. Within that period, it is appropriate to concentrate on the years surrounding the First World

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[1] T. McKeown, *The Modern Rise of Population* (London, 1976).

[2] P. Razzell, "Population Change in Eighteenth Century England. A Reinterpretation," *Economic History Review* (1965), pp. 312-32.

[3] W. Leslie MacKenzie, *Scottish Mothers and Children* (Dunfermline, 1917).

[4] McKeown does approach a form of nutritional determinism, and although some of the findings of this study point toward the decisive importance of nutrition, they are not meant to imply that nutrition and only nutrition mattered in the process of infant mortality decline.

War. Firstly, the question of the impact of the 1914-18 war on the standards of living and health of the civilian populations of Europe is still unresolved.[5] Secondly, wartime conditions provided the only occasion in the twentieth century when medical intervention at home was severely and for a time demonstrably curtailed. An examination of the war period should provide a unique case study of the relative contribution to infant mortality decline of the other two factors — health administration and standards of living — as well as evidence about the effect, if any, on vital statistics of the removal of the bulk of the medical profession from civilian practice.

I — The Course of Infant Mortality Decline

The statistics presented in Tables 1-2 describe the decline of infant mortality rates (IMRs) in Britain in the first three decades of this century. We have indexed the trend of infant mortality decline according to the overall IMR for each county in England and Wales in 1901-03 and for each county in Scotland in 1902-04, when complete data first appear. We have divided the first thirty years of the century into four periods: 1901-03 to 1907-09; 1907-09 to 1913-14; 1913-14 to 1919-21; and 1919-21 to 1926-28. The war period has been designated as 1913-14 to 1919-21 to describe the years between which the war economy operated. A two-year average for the end of the pre-war period (1913-14) has been adopted to avoid inflating pre-war levels of infant mortality (and thereby wartime decline) by including in them the abnormally high 1915 IMRs.

Starting from a level of around 150 deaths per 1,000 live births in England and Wales, and around 115 in Scotland, around the turn of the century, IMRs dropped by one-half in England and Wales and by one-quarter in Scotland in three decades. Taking the level of infant mortality in each county in England and Wales in the years 1901-03 and in each Scottish county in 1902-04 as the standard of comparison (Tables 1-2), it is possible to see marked variations in the process of infant mortality decline. Some southern counties, such as Surrey, Middlesex, and Essex, experienced the most precipitous decline early in the century. In other northern and western counties, such as Cardigan, Cumberland, or Staffordshire, the decline in IMRs early in the century was much more modest. In Scotland, as we can see in Table 2, the initial decline in IMRs early in the century was slight in comparison to that south of the border. Indeed, in seven counties of Scotland, there occurred a worsening of infant mortality rates in the first decade of this century. As

[5] Contrast G. Hardach, *The First World War* (London, 1977), with J.M. Winter, "The Demographic Effects of the Two World Wars, with Special Reference to Western Europe," *Proceedings of the Seventh International Economic History Conference* (Edinburgh, 1978).

TABLE 1

INDEX OF INFANT MORTALITY RATES, COUNTIES OF ENGLAND AND WALES (each county in 1901-03 = 100)

County	1907-09	1913-14	1919-21	1926-28
England:				
Beds	87	79	64	53
Berks	83	63	57	46
Bucks	78	65	57	48
Cambs	85	67	50	51
Cheshire	81	73	56	45
Cornwall	85	73	60	50
Cumberland	99	84	75	59
Derby	85	79	64	50
Devon	85	61	50	42
Dorset	84	75	63	55
Durham	86	86	69	54
Isle of Ely	—	—	—	—
Essex	76	59	49	40
Glos	88	65	57	49
Hampshire	79	—	—	—
Hereford	79	71	63	51
Herts	86	73	54	52
Hunts	84	79	77	59
Kent	75	66	54	43
Lancs	85	74	57	46
Leics	82	65	51	42
Lincs (Holland)	85	* 72	* 60	* 48
Lincs (Kesteven)	—	* 64	* 57	* 44
Lincs (Lindsey)	—	* 73	* 60	* 46
London	81	75	56	—
Middx	75	66	52	43
Monmouth	87	79	63	53
Norfolk	83	67	48	47
Northants	81	70	62	45
Northumberland	81	73	62	48
Notts	86	67	57	43
Oxford	86	64	59	45
Peterborough	—	—	—	—
Rutland	—	—	—	—
Shropshire	90	78	66	50
Somerset	89	70	61	49
Staffs	89	77	59	48
Suffolk E.	83	* 71	* 60	* 52
Suffolk W.	—	* 63	* 52	* 46
Surrey	75	65	52	44
Sussex E.	83	69	* 51	* 47

TABLE 1

County	1907-09	1913-14	1919-21	1926-28
Sussex W.	—	—	* 50	* 54
Warwick	82	58	46	39
Westmorland	95	97	79	57
Isle of Wight	—	—	—	—
Wilts	85	74	70	54
Worcs	88	74	54	50
Yorks E.	81	58	50	39
Yorks N.	88	71	62	48
Yorks W.	82	76	62	46
Wales:				
Anglesey	82	76	66	67
Brecknock	87	83	67	59
Caernarvon	84	88	65	62
Cardigan	93	85	62	63
Carmarthen	92	85	67	48
Denbigh	84	79	67	55
Flint	95	92	79	63
Glamorgan	88	77	60	51
Merioneth	84	74	54	54
Montgomery	90	78	73	55
Pembroke	96	89	65	53
Radnor	87	75	60	63
England and Wales	83	77	60	49

* These figures use the 1901-03 average for the combined area.

Source: J.M. WINTER, "Infant Mortality in Britain during the First World War", SSRC Report HR/5091, Appendix I, Tables 1-3. Hereafter referred to as "Appendix I to SSRC report".

is shown in Table 2, this deterioration occurred primarily in counties such as Kinross or Wigtown, in which IMRs in 1902-04 were significantly lower than those for Scotland as a whole. Counties registering higher IMRs, such as Lanark or Forfar, showed very modest improvements in the years prior to the First World War. The initial drop in IMRs in Britain, therefore, was greater in the south than in the north.

Two additional features of infant mortality decline are apparent here. In England and Wales, both the period after the turn of the century *and* the war period were the occasions for the steepest declines in IMRs in the first thirty years of this century. In Scotland, the most striking gains in infant survival rates were registered during the First World War.

There is a much greater degree of uniformity in the English and Welsh

TABLE 2

INDEX OF INFANT MORTALITY RATES, SCOTTISH COUNTIES
(each county in 1902-04 = 100)

County	1907-09	1913-14	1919-21	1926-28
Aberdeen	98	99	88	75
Argyll	86	85	90	71
Ayr	94	94	85	76
Banff	104	107	93	86
Berwick	90	84	76	73
Bute	106	103	47	85
Caithness	91	100	86	74
Clackmannan	95	101	86	83
Dumfries	90	96	71	70
Dunbarton	101	100	85	74
Edinburgh	98	88	85	69
Elgin	98	101	84	76
Fife	103	95	81	73
Forfar	96	96	83	84
Haddington	97	83	68	65
Inverness	89	80	72	57
Kincardine	88	86	80	78
Kinross	137	98	90	72
Kirkcudbright	89	82	100	86
Lanark	96	92	78	74
Linlithgow	99	91	78	68
Nairn	78	93	54	63
Orkney	84	100	89	76
Peebles	75	57	54	48
Perth	90	91	84	73
Renfrew	88	93	75	75
Ross & Cromarty	90	63	69	68
Roxburgh	90	84	74	64
Selkirk	86	65	60	58
Shetland	111	114	88	75
Stirling	94	92	78	71
Sutherland	82	84	86	58
Wigtown	106	92	107	95
Scotland	96	94	81	73

Source: Appendix I to SSRC report, Tables 10-12.

county decline in the war period compared to that of Scottish counties. Some Scottish counties, such as Kirkcudbright and Wigtown, showed an increase in IMRs, whereas steep declines were registered in Bute, Haddington, and Nairn. The concentration of population in Lanark and Edinburgh counties meant that their statistics determined the downward trend in aggregate IMRs for Scotland during the war.

The first conclusion of this part of this paper is that for many parts of Britain, the war years were the period of the most significant improvement in IMRs in the first thirty years of this century. This fact is illustrated in much greater detail in records of infant mortality in English and Welsh County Boroughs (CBs), of the experience of London Metropolitan Boroughs (MBs), and of the experience of principal Scottish burghs.

In the case of English CBs, it is clear that the most striking gains in infant survival rates were made in urban areas marked by some of the worst conditions of Victorian and Edwardian poverty. Declines much greater than the average for England and Wales were registered in Birmingham, Bolton, St. Helens, and Wigan in England, and in Newport and Swansea in Wales. These towns housed workers in the metal trades, textiles, the mines, and ports, wherein were employed a majority of semi-skilled or unskilled men.

The same leading role of areas of pre-war impoverishment can be seen when we consult the statistics concerning London MBs. The boroughs leading the way in the overall trend of infant mortality decline during the First World War were Shoreditch, Bermondsey, Stepney, and Bethnal Green, the heart of 'outcast London'. In Scotland, the industrial districts of Coatbridge, Glasgow, Dundee, and Paisley are well in advance of the Scottish pace of improvement in infant health.

We can extend our analysis of the course of infant mortality decline by an examination of additional evidence collected in pre-war and wartime social surveys. The first source in question is the study of pre-war infant and child mortality which appeared as a supplement to the 1916 report of the chief medical officer of the LGB (Local Government Board), Dr. (later Sir) Arthur Newsholme.[6] The second is the study of the health and welfare of Scottish mothers and children, sponsored by the Carnegie U.K. Trust and conducted by Dr. (later Sir) Leslie MacKenzie, Medical Member of the LGB for Scotland.[7]

Newsholme's study ranked administrative areas in terms of how high or low their IMRs were in the period 1911-14 and investigated social conditions in these extreme cases. We have presented in Table 3 a list of the eight CBs and MBs of highest and lowest IMRs in 1911-14. To these we have added the eight principal burghs registering highest IMRs and the seven registering the lowest IMRs in Scotland. In all three cases, wartime decline was signi-

[6] Parliamentary Papers, 1917-18, vol. XVI, Cd 8496.

[7] MacKenzie, *Scottish Mothers.*

TABLE 3

WARTIME INFANT MORTALITY DECLINE IN COUNTY BOROUGHS, METROPOLITAN BOROUGHS, AND PRINCIPAL SCOTTISH BURGHS OF HIGH OR LOW INFANT MORTALITY RATES IN 1911-14

Areas of Lowest IMRs in 1911-14	IMR 1911-14	Indexed Wartime Decline in IMRs	Areas of Highest IMRs in 1911-14	IMR 1911-14	Indexed Wartime Decline in IMRs
Metropolitan Borough			Metropolitan Borough		
Hampstead	74	8	Shoreditch	148	33
Lewisham	82	12	Finsbury	133	34
Stoke Newington	83	9	Bermondsey	131	29
Chelsea	84	6	Bethnal Green	126	25
Woolwich	84	9	Poplar	123	22
Westminster	92	8	Stepney	122	24
St. Pancras	97	10	Southwark	122	21
Wandsworth	94	16	Deptford	112	16
County Borough			County Borough		
Bournemouth	77	— 1	Burnley	172	31
Eastbourne	77	1	Stoke-onTrent	161	31
Bath	78	— 2	Wigan	159	29
East Ham	82	5	Barnsley	151	19
Oxford	82	21	Preston	149	32
Southend-on-Sea	83	15	Middlesbrough	144	6
Reading	89	14	St. Helens	143	26
Coventry	90	8	Blackburn	143	19
Burgh			Burgh		
Falkirk	100	10	Dundee	154	21
Kilmarnock	101	— 7	Aberdeen	135	18
Kirkcaldy	104	29	Glasgow	131	19
Motherwell	104	5	Coatbridge	130	27
Perth	105	— 6	Ayr	115	24
Clydebank	107	28	Greenock	114	11
Edinburgh	109	4	Hamilton	114	17
			Paisley	114	28

Sources: Appendix I to SSRC Report, Tables 6, 9, 15; Parl. Papers, 1917-18, Vol. XVI, Cd 8496, pp. 21, 22.

ficantly greater in those areas which had high pre-war IMRs. The English data show as well that the higher the pre-war IMR, the greater the wartime decline. In contrast, areas of relatively low pre-war IMRs gained little on average in the war period. These CBs of relatively low pre-war infant mortality were all in the south of England, which suggests that the wartime decline was especially marked in the industrial concentrations of the Midlands and north.

Data on urban overcrowding collected by Newsholme and MacKenzie support a second argument that the greatest wartime gains were registered in areas of inadequate urban housing in the pre-war period. Newsholme ranked CBs and MBs according to the percentage of the population living more than two to a room. MacKenzie presented comparable but not identical data on overcrowding in the form of the percentage of families living in two rooms or less in seven Scottish burghs. Table 4 shows that the most severely overcrowded areas experienced the greatest wartime improvements in IMRs.

Thirdly, we can examine data on infant mortality decline in areas ranked according to the proportion of the female population in employment. In Table 5 we have listed CBs and MBs identified by Newsholme on the basis of 1911 census returns as areas of high or low pre-war rates of female employment. To these we have added a second set of CBs. Rates of employment of married or widowed women in 1916 were estimated in these areas by MOHs (Medical Officers of Health) who submitted reports to Dr. E.W. Hope during his study of maternal and child health and welfare in England and Wales, sponsored by the Carnegie U.K. Trust.[8] The reliability of these data is questionable, in that they may describe guesses by MOHs on questions beyond their competence.[9] Nevertheless, the fact remains that both sets of data show that wartime infant mortality decline in areas of high levels of female employment was as great or greater than that in areas of relatively low levels of female employment.

II — Factors Associated with Infant Mortality Decline

a - *Fertility Decline*

The study is concerned primarily with relating infant mortality decline to changes in health administration, medical intervention, and standards of living. But before we survey evidence on these matters, we must first confront the possibility that infant mortality decline was a function of fertility decline, which began in Britain in the 1870s, but which continued throughout

[8] E.W. Hope, *Report on the Physical Welfare of Mothers and Children.* England and Wales. Volume I (Dunfermline, 1917).

[9] The Carnegie Trust deposited at the Scottish Record Office papers relating to these enquiries, but they do not throw much light on the procedures adopted in them. MOH returns apparently have not survived.

TABLE 4

WARTIME INFANT MORTALITY DECLINE AND OVERCROWDING

Areas of Least Overcrowding	% Over-Crowded *	Indexed Wartime Decline in IMRs	Areas of Greatest Overcrowding	% Over-Crowded *	Indexed Wartime Decline in IMRs
Metropolitan Borough			Metropolitan Borough		
Lewisham	4.0	12	Finsbury	39.9	34
Hampstead	7.1	8	Shoreditch	36.5	33
Woolwich	6.3	9	Stepney	35.0	24
Stoke Newington	8.8	9	Bethnal Green	33.2	25
Westminster	12.9	8	Southwark	25.9	21
Chelsea	14.9	6	Holborn	25.6	14
County Borough			County Borough		
Bournemouth	1.6	−1	Gateshead	33.7	19
Oxford	2.4	21	Sunderland	32.6	16
Reading	3.1	14	St. Helens	17.0	26
Wallasey	3.3	13	Dudley	15.0	30
Southport	3.6	18	Middlesbrough	13.4	6
Southend-on-Sea	3.6	15	Wigan	12.9	29
Croydon	4.3	13	West Bromwich	12.2	17
Eastbourne	4.3	1	Liverpool	10.1	20
			Burgh **		
			Paisley	65	28
			Dundee	63	21
			Glasgow	62	19
			Greenock	59	11
			Aberdeen	39	18
			Edinburgh	37	4
			Perth	30	26

* Percentage of the population living more than two occupants to a room.
** Percentage of families living in two rooms or less.

Sources: Appendix I to SSRC Report, Tables 6, 9; Parl. Papers, 1917-18, Vol. XVI, Cd 8496, pp. 70-71; MACKENZIE, *Scottish Mothers and Children*, Ch. X.

TABLE 5

WARTIME INFANT MORTALITY DECLINE AND RATES OF EXTRA-DOMESTIC FEMALE LABOUR

County Boroughs of High Female Employment Rates	Indexed Wartime Decline in IMRs	County Boroughs of Low Female Employment Rates	Indexed Wartime Decline in IMRs
I. Newsholme Estimates *			
Burnley	31	Middlesbrough	6
Wigan	29	St. Helens	26
Preston	32	Barnsley	19
Oldham	27	Walsall	22
Salford	21	West Bromwich	17
Manchester	22	Rotherham	29
Blackburn	19	Gateshead	19
Leeds	15	Sheffield	20
II. Hope Estimates			
Blackburn	19	Rotherham	29
Leicester	20	St. Helens	26
Nottingham	26	South Shields	8
Preston	32	Newport	27
Oldham	26	Merthyr Tydfil	24
Rochdale	12	Lincoln	12
Stockport	29	Darlington	— 9
Blackpool	29	West Hartlepool	9

* Selected areas of high infant mortality rates, in rank order.
Sources: Appendix I, to SSRC Report, Table 6; Parl. Papers, 1917-18, Vol. XVI, Cd 8496, p. 74; HOPE, *Physical Welfare*, Epitomes of Local Reports.

the period under review. Some data have recently been collected by the Office of Population Research at Princeton University which permit a preliminary investigation of this question. The Princeton demographers have standardized European fertility movements by reference to the flow of births one would expect if European women conformed to the highest fertility schedule on record, that of Hutterite women married in the years 1921-30.[10] In this way, they have charted the shift from natural to controlled fertility throu-

[10] A. COALE, "The Decline of Fertility in Europe from the French Revolution to World War II," in S.J. BEHRMANN (ed.), *Fertility and Family Planning: A World View* (Ann Arbor, Michigan, 1969), pp. 3-24.

ghout Europe in the period 1870-1939.[11] Dr. M.S. Teitelbaum has collected data for the United Kingdom, and has provided us with indices of marital fertility for English, Welsh and Scottish counties over the period 1900-30. If fertility decline were responsible for infant mortality decline (or vice-versa), we would expect to be able to calculate correlation coefficients between them sufficiently high to demontrate the causal connection. Table 6 describes the observed correlation coefficients for decennial changes in county level IMRs and indices

TABLE 6

CORRELATION COEFFICIENTS RELATING MARITAL FERTILITY DECLINE AND INFANT MORTALITY DECLINE IN COUNTIES OF ENGLAND AND WALES AND SCOTLAND, 1901-31 *

Date	England and Wales **	Scotland ***
1901-1911	— 0.199	0.105
1911-1921	0.203	0.052
1921-1931	0.114	0.162

* Indices of marital fertility refer to 1901, 1911, 1921, and 1931.

** Infant mortality decline was calculated using three-year averages for 1900-02; 1910-12; 1920-22; and 1928-30.

*** Infant mortality decline was calculated using three-year averages for 1902-04; 1910-12; 1920-22; and 1928-30.

Sources: See text.

of county marital fertility in the years 1900-30. No data are as yet available for smaller administrative units.[12] But at the county level, we can see that there is no statistically significant correlation between changes in marital fertility and decennial changes in IMRs.

b - *Medical Intervention*

It has not been possible to answer rigorously the question as to the relationship between variations in levels of medical intervention and IMRs in the period of the First World War. The main reason for the tentativeness of the following brief discussion is the fact that we were unable to explore the British Medical Association archives in London. Consequently, we have been

[11] L. HENRY, "Some Data on Natural Fertility," *Eugenics Quarterly* (1961).

[12] Prof. Dov Friedlander of the Hebrew University of Jerusalem has collected data on smaller administrative units, which material could be used for similar purposes.

unable to provide a map of the distribution, before and during the war, of medical personnel in Scotland, England, and Wales. The only major alternative source available was the Ministry of National Service papers deposited at the Public Record Office in London.

In order to ensure an adequate supply of doctors for the armed forces, the War Office in 1914-16 and the Ministry of National Service in 1916-18 had to draw up, in conjunction with leading representatives of the medical professione, the outlines of a medical manpower policy. In this way the mandarins of the profession effectively controlled the distribution of doctors as between military and civilian needs. The records of these deliberations and of the workings of the Ministry provide us with an indirect indication of the military drain on civilian medical care. In 1917, the examination of army recruits was taken out of the hands of military doctors and placed completely in civilian control. In the last year of the war, most of the doctors in Britain not in uniform were occupied in the difficult and time-consuming task of determining the fitness for military service of over 2,500,000 men. Especially during the influenza epidemic in the last months of the war, many doctors told the Ministry of National Service that the civilian population was in danger because of the absence in military service of over 60% of the nation's doctors. Petitions from residents of rural areas show how some communities were served by aged doctors dragged out of retirement by the war emergency and others simply had to do without any medical assistance at all.[13] While statistical information is lacking, it is still possible to conclude that levels of medical intervention throughout Britain were significantly reduced during the war.

This war-related reduction in health services undoubtedly affected the well-to-do much more than the working class. Scottish evidence shows that there was a direct correlation between the size of a family dwelling and recourse to a doctor during childbirth.[14] To some extent, the class divide over the question of medical management of delivery was narrowing before the war. Following the introduction of the 30/— maternity benefit under the National Insurance Act of 1911, there was a rise in the proportion of working-class women attended by doctors during childbirth.[15] The recruitment of women during the war into the labour force meant that the proportion of all women eligible as insured workers for maternity grant also increased. The shortage of doctors meant, though, that whatever a woman's preference, midwives and not doctors managed the bulk of wartime deliveries.

There were those, including T. H. Stevenson, Superintendent of Statistics for England and Wales, who pointed out that the absence of doctors in wartime

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[13] J.M. Winter, "Military Fitness and Civilian Health in Britain During the First World War," *Journal of Contemporary History* (1980).

[14] MacKenzie, *Scottish Mothers*, ch. VI.

[15] MacKenzie, *Scottish Mothers*, ch. IV.

probably produced a decline in recourse to instrumental delivery, a practice which midwives were not permitted to perform. It would be rash to infer that herein lay a cause of the drop in neonatal mortality rates during the war, in that babies who might have been damaged by poorly applied forceps survived the war unscathed.[16] It is probably safer to conclude, from infant mortality and maternal mortality rates, that the absence of doctors from civilian practice in Britain had no adverse effects on the management of delivery or its outcome.

c - *Health Administration*

Until the formation of the Ministry of Health in 1919, primary responsibility for policies related to infant and maternal health lay with the LGB. On the eve of the outbreak of war, the LGB circularized local authorities to encourage them to submit proposals for grants to help establish programmes to promote infant and maternal health and welfare.[17] Many infant and child welfare centres and schools for mothers had been established by voluntary associations before 1914, but the LGB hoped to coordinate and extend existing services by the provision of grants in aid. The LGB pressed the matter later in the war, under the fuller authority granted to it under the Notification of Births (Extension) Act of 1915. In 1916, the Carnegie U.K. Trust began an enquiry to determine how its resources could be used most effectively to further such schemes. It invited MOHs in England and Wales to file reports on health conditions and provisions. Epitomes of these reports were published in the first volume of the Carnegie study of the health of mothers and children in England and Wales.[18] Tables 7 and 8 summarize the statistical information about health administration presented in this volume. The evidence is probably not reliable in all details. Some of the population figures appear to be conjectural. Doubts about the accuracy of estimates of the propensity of married or widowed women to work have already been raised. But on the questions of variations in the number of people employed on matters relating to infant welfare work; on the total number of health centres, clinics, or consultations in each district; and on the total number of registered midwives and the proportion of births attended by them, we can rely on the accuracy of these returns. What they show primarily is how embryonic and understaffed were early attempts to provide institutions to which pregnant women or mothers could go for advice and support. The existence of a few score child welfare clinics, and fewer ante-natal care clinics, in the entire country could hardly have been responsible for improvements in infant survival rates registered during the First World War. Traditional

[16] WINTER, " Some Aspects of the Demographic Consequences of the First World War in Britain," *Population Studies* (1976), p. 548.

[17] WINTER, " The Impact of the First World War on Civilian Health in Britain," *Econ. Hist. Rev.* (1977), p. 490.

[18] HOPE, *Physical Welfare.*

and (to judge by some of the prejudiced comments of MOHs in the Carnegie reports) justified working-class suspicion of doctors probably kept many working women away from these centres, which reached a majority of pregnant women only on the eve of the Second World War.[19]

Midwifery was, in contrast, a recognized and widely accepted part of the life of working-class communities. This may have been due in part to the fact that midwives charged 2*s.* 6*d.* for deliveries, compared to the traditional doctor's fee of one guinea, but popular attitudes were probably more than reflections of the desire to economize on the costs of childbirth. There is some indication in the statistics in Tables 7 and 8 that midwives managed a higher proportion of deliveries in some urban areas compared to some rural areas. For example, over 70% of births in the Welsh district of Aberdare, and over 90% in Merthyr Tydfil were attended by midwives. In contrast, in London as a whole, midwives conducted only 25% of deliveries, which is probably related to the presence in the metropolis of teaching and maternity hospitals within easy reach of the population. Other urban areas, such as Smethwick or Liverpool, for instance, do not conform to this pattern, and their MOHs reported high rates of attendance by midwives.

We cannot conclude that deliveries not attended by midwives were performed by doctors, especially during the war. In many parts of Britain, untrained 'handywomen' looked after women in confinement. Some doctors were certain that these women's services were on occasion positively lethal,[20] but there is no evidence that variations in maternal mortality rates in this period reflected variations in recourse to the professional management of delivery. In the light of the high proportion of registered midwives who were untrained, and because of the recognized shortage of midwives in many areas, it is probably safest to conclude that midwifery and other para-medical support for maternal and child health were not primarily responsible for wartime improvements in infant survival rates.

Wartime developments in health administration were supported fully by the LGB, but many county councils and local authorities were simply not prepared during the war to spend ratepayers' money on schemes for infant and maternal welfare. Dr. D Rocyn Jones, the Monmouthshire county MOH, circulated to the county public health committee the responses of all county councils and county borough councils in England and Wales to an LGB circular asking in May, 1916, whether schemes for infant consultation centres had been adopted. Cornwall, Cumberland, Durham, and East Suffolk county councils all replied that action had been deferred due to the need to economize during

[19] Hope, *Physical Welfare*, especially the comments of the MOH for Finsbury; and Winter, "Infant Mortality, Maternal Mortality, and Public Health in Britain in the 1930s," *Journal of European Economic History* (1979).

[20] T. Ferguson, *Scottish Social Welfare 1864-1914* (Edinburgh, 1958), pp. 510-11.

the war. In other counties, a much less hesitant policy was adopted frequently on the basis of the belief that infant welfare was a form of Imperial defence. But overall, the document prepared by Dr. Jones reinforces the conclusion drawn from Tables 7 and 8 as to the inadequacy of public provision for infant and maternal health during the First World War.[21] A full examination of the local politics of health, though, would be required to describe variations in the level of opposition to the extension of services for the infant and maternal population, and how such resistence was overcome.

d - *Standards of Living*

If medical intervention and institutional provision for maternal and infant health were not primarily responsible for wartime movements in IMRs, we must conclude that infant mortality decline was due to the only other possible cause, namely an increase in the standard of nutrition of the working population which arose out of an improvement of the standard of living of the working class, and in particular of the unskilled and semi-skilled strata within it. Better nutrition for mothers and infants permitted women to give birth to healthier babies, whose resistance to disease was strengthened, and who thereby were more likely to survive the first year of life than were those born before 1914.

This is not the place to specify what is meant by a 'standard of living'. In this context, we can rely on contemporary definitions drawn up by by civil servants, politicians, trade unionists, and industrialists sensitive to the need to prevent the placing of the full cost of the war on the shoulders of the working class. The evidence on this problem is complex and contradictory, but it appears that efforts to limit if not eliminate a war-related decline in the standard of living were successful, and that consequently, large sections of the working class were better fed during the war that before it.[22]

There were two sources of supplementary earnings in wartime which made it possible for most wage-earners and their families to catch up with and keep pace with price inflation. The first arose out of changes in the wage structure of war-related industry. After the first wave of volunteers joined Kitchener's Armies in the fall of 1914 and as the needs of a long war began to sink into the minds of leaders and led alike, a fundamental change in the skill composition of the labour force took place. The privileges of skilled men had to be sacrificed in the effort to maximize output. Dilution and the enormous expansion of the

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[21] Gwent Record Office. C.H.C.R. Special Report on Infant Welfare, by D. Rocyn Jones, dated 1 July 1916.

[22] Public Record Office. Ministry of Agriculture and Fisheries (MAF) Papers 60/104. C.A. McCurdy, "Index Number of Retail Prices," dated 19 August 1920, with supporting Cabinet Papers, summarizing the discussion of the problem of standards of living during the war.

munitions industries and allied trades increased working-class incomes in the following ways:

(1) Unemployment and casual employment were virtually eliminated, and previously unoccupied women and school-leavers were recruited to full-time work. Wages were more regular, and wage-earners more numerous in working-class households.

(2) There was a shift of workers from low paid jobs to better paid employment in many urban areas.

(3) Across-the-board war bonuses and war wage advances, such as that of 20% per week over the pre-wartime rates of engineering, shipbuilding, and railway workers, by November, 1917, meant that the pre-war wage differentials were significantly reduced.

(4) The establishment of a minimum wage of 25s. per week for agricultural workers led to considerable advances in the earnings of rural workers.

(5) The need for overtime, night and weekend work provided greater earnings for workers wirth the stamina to face a 70-hour work week; and

(6) The greater recourse to piece-rate payment under conditions of heavy pressure to maximize output increased wages, particularly among unskilled and semi-skilled male and female recruits to industry during the war.

The second way in which wartime standards of living were protected and in many cases improved was through the provision of subsidies to family income by direct or indirect actions of state and local authorities. Family incomes were supplemented in the following ways:

(1) Through pre-war social provision, such as

(*a*) Old Age Pensions;

(*b*) Payments under the health insurance provisions of the National Insurance Act of 1911;

(c) Payment of Maternity Benefit of 30s. if the woman's husband were an insured worker, and of 60s. if both husband and wife were insured, a case occuring with much greater frequency during the war; and

(2) Through wartime social provision, some of which antedated the war but which were changed during it, such as

(*a*) Separation allowances paid to wives of men in uniform and which varied according to the number of children in the family;

(*b*) Free school meals for older children throughout the year, which practice thereby released more of the family income for food expenditure for the rest of the family;

(*c*) Free milk or food at cost price provided by infant welfare centres to nursing mothers and infants;

(*d*) Meals in industrial canteens for day-shift workers;

(*e*) Grants and assistance under the Prince of Wales National Relief Fund and, to a decreasing extent, under the Poor Law.

At the same time some public measures helped keep the cost of living within acceptable bounds for most families. Four examples are:

(1) Rent control, probably the most important wartime measure in terms of controlling the cost of living and working-class discontent;

(2) Rationing of some items and subsidies of others by the last year of the war, which kept them within the reach of most families;

(3) A reduction in the specific gravity of beer and in the supply of beer and alcoholic beverages, which taken together with the introduction of licensing hours reduced an important drain on family incomes; and

(4) The success of the Food Campaign of 1916–18, which permitted Britain to avoid the plague of black marketeering which spread in Germany during the last years of the war, and which helped undermine the German war economy and prepare the way for defeat.

The decline of poverty in Britain during the war, as a result of the workings of the wartime labour market and the operation of social policy, is a phenomenon of the utmost importance to the historian of infant health and welfare in this period. Many social observers were aware of it. Among them were the MOHs who submitted returns to the Carnegie study of 1917 in which they remarked repeatedly about the diminution of wartime urban poverty. At the same time, many also noticed that there had been little or no improvement in housing and sanitation during the war. In Darlington, Derby, Newcastle-upon Tyne, and Tynemouth, the MOHs wrote that plans to destroy derelict housing or to convert midden privies to water carriage systems of sewage removal were not carried out during the war due to the need to economize.[23] This evidence confirms the argument that improvements in housing or sanitation could not have been responsible for gains in infant health and welfare during the war. The prime agency at work, we must conclude, was a rise in family incomes, especially among the poorest sections of the population, which reduced the economic distance between strata within the working class and between classes, and improved the life chances of the infant population of Britain during the First World War.

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[23] Hope, *Physical Welfare*, Resumés of Local Reports.

TABLE 7

PUBLIC PROVISION FOR INFANT AND MATERNAL WELFARE IN SOME COUNTIES OF ENGLAND AND WALES, 1915-1916, WITH MATERNAL MORTALITY RATES, 1915, AND PERCENTAGE OF MARRIED AND WIDOWED WOMEN IN EMPLOYMENT, 1915

County	Estimated Population **	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	County Centres for Infant & Maternal Health: Local Authority	County Centres for Infant & Maternal Health: Voluntary	County Centres for Infant & Maternal Health: Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
1. Berkshire	198,393	113	20	50	0	0	0	2	0	4.9	12
2. Cambridgeshire	132,788	30	13	33	3	20	0	2	0	3.5	12
3. Cardiganshire	59,879	9	16	n.a.	0	3	0	0	0	6.3	16
4. Carmarthenshire	163,622	19	70	50	0	0	0	0	0	7.2 *	10
5. Carnarvon	116,636	26	32	50	32		0	9	9	6.6	11
6. Cheshire	604,528	158	211	70	0	20	0	5	3	5.3 *	14
7. Cornwall	329,000	147	35	43	0	0	0	3	3	9.8 *	9
8. Cumberland	216,652	58	21	43	0	10	0	0	0	4.0 *	10
9. Derbyshire	553,990	186	212	76	0	35	4	0	0	4.2	9
10. Dorset	227,879	66	30	n.a.	0	9	0	0	0	2.6 *	11
11. Durham	956,709	111	118	19	0	26	0	6	0	3.9	5
12. Essex	860,695	154	50	30	0	0	0	3	0	4.3	9
13. Glamorgan	802,452	239	399	n.a.	0	0	0	1	0	5.4 *	6

TABLE 7 (*continued*)

County	Estimated Population **	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	County Centres for Infant & Maternal Health: Local Authority	County Centres for Infant & Maternal Health: Voluntary	County Centres for Infant & Maternal Health: Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
14. Gloucestershire	332,325	151	105	59	0	69	0	14	0	3.5*	13
15. Hereford	114,354	59	78	n.a.	0	0	0	1	0	5.1*	12
16. Hertfordshire	325,838	92	26	54	0	8	0	12	0	3.8	10
17. Huntingdonshire	55,685	8	8	16	0	0	0	1	0	6.3*	9
18. Lancashire	1,666,488	433	489	56	4	0	0	36	0	5.4*	20
19. Lincolnshire (Lindsey)	249,310	27	23	n.a.	0	50	0	4	0	3.4	8
20. Merionethshire	45,365	16	n.a.	35	0	0	0	1	0	4.9*	13
21. Middlesex	1,237,753	208	71	43	0	0	0	7	0	3.3*	11
22. Monmouthshire	335,937	121	129	71	9	1	0	0	0	6.7*	6
23. Montgomeryshire	51,249	27	65	n.a.	0	20	0	0	0	3.8*	15
24. Norfolk	324,351	97	33	20	1	1	0	2	0	4.8*	9
25. Nottinghamshire	353,193	99	79	57	0	0	0	0	0	4.1	8
26. Northamptonshire	213,733	55	57	43	10	0	0	2	0	2.4	11
27. Northumberland	394,694	122	18	15	0	0	0	1	0	4.4*	6
28. Oxfordshire	138,380	85	33	44	0	7	0	2	0	3.3*	11
29. Radnorshire	22,284	9	16	n.a.	0	0	0	0	0	4.2*	14

TABLE 7 (*continued*)

County	Estimated Population **	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	County Centres for Infant & Maternal Health: Local Authority	County Centres for Infant & Maternal Health: Voluntary	County Centres for Infant & Maternal Health: Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employmen
30. Salop	232,508	120	140	75	6	32	0	2	2	3.5 *	10
31. Somersetshire	394,853	198	58	41	1	6	0	2	0	2.2 *	14
32. Staffordshire	685,318	129	191	65	6	37	0	1	0	3.8	10
33. Suffolk, West	107,772	53	26	40	0	1	0	0	0	3.5	12
34. Surrey	754,157	190	52	35	0	22	0	20	0	4.3	11
35. Sussex, West	182,598	45	16	45	0	23	0	4	0	2.8 *	12
36. Warwickshire	320,013	106	100	59	15	0	0	8	8	3.0 *	12
37. Westmoreland	63,158	6	10	30	0	0	0	3	3	0.9	11
38. Wiltshire	280,519	113	65	52	8	84	0	4	0	2.8 *	9
39. Worcestershire	280,212	101	97	59	8	0	0	7	0	4.0 *	14
40. Yorkshire, East Riding	158,000	8	11	10	0	0	0	0	0	4.2 *	10
41. Yorkshire, North Riding	305,516	29	31	13	0	4	0	0	0	3.7 *	10
42. Yorkshire, West Riding	1,493,660	147	447	66	50	50	0	8	0	4.7 *	11

* Maternal Mortality Rate, 1914 All such rates refer to deaths per 1,000 deliveries per year.
** Excluding County Boroughs.

Source: E.W. HOPE, *Report on the Physical Welfare of Mothers and Children*, Vol. 1 (1917), Epitomes of County Reports.

TABLE 8

PUBLIC PROVISIONS FOR INFANT AND MATERNAL WELFARE IN SOME DISTRICTS IN ENGLAND AND WALES, 1915-1916, WITH MATERNAL MORTALITY RATES, 1915, AND PERCENTAGE OF MARRIED AND WIDOWED WOMEN IN EMPLOYMENT, 1915

County Borough or District	Estimated Population	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	Municipal Infant Welfare Centres	Volunteer Infant Welfare Centres	Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
1. Aberdare	53,427	26	17	72	1	0	1	0	0	5.3	5
2. Acton	58,238	13	2	50	2	0	2	2	0	2.0	20
3. Barnsley	53,929	n.a.	n.a.	79	1	0	0	0	0	4.8	9
4. Bath	70,292	8	12	55	2	0	1	1	0	6.6	18
5. Bermondsey	123,845	n.a.	n.a.	20	0	2	2	5	0	2.8	18
6. Birkenhead	140,291	78	0	60	4	0	1	0	0	5.7	10
7. Birmingham	891,234	73	156	59	11	19	5	7	7	3.4	22
8. Blackburn	135,110	21	24	61	4	0	3	1	1	3.2	42
9. Blackpool	65,110	8	21	37	1	0	1	0	0	9.0	25
10. Bolton	186,504	33	26	80	3	0	0	6	0	5.2	17
11. Bootle	74,285	24	2	85	2	4	0	1	1	4.9	10
12. Bournemouth	85,000	8	4	21	1	0	0	4	0	0.8	14
13. Bradford	293,380	27	27	51	20	0	1	0	1	7.2	21

TABLE 8 (*continued*)

County Borough or District	Estimated Population	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	Municipal Infant Welfare Centres	Volunteer Infant Welfare Centres	Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
14. Brighton	133,936	16	12	80	0	2	4	0	0	2.1 *	19
15. Bristol	352,859	34	34	56	6	1	0	15	3	2.0	15
16. Camberwell	264,121	n.a.	n.a.	55	0	0	0	0	0	2.2	15
17. Cambridge	57,159	7	0	50	n.a.	n.a.	0	1	0	4.0	18
18. Cardiff	188,495	70	60	75	2	3	2	0	1	3.5	9
19. Carlisle	52,625	n.a.	n.a.	48	1	1	0	3	3	2.5	11
20. Chelsea	67,200	n.a.	n.a.	40	1	0	0	1	1	3.7	23
21. Coventry	127,089	30	12	73	0	4	1	3	0	2.4	11
22. Croydon	177,345	21	12	n.a.	1	7	1	5	0	3.0 *	11
23. Darlington	41,038	7	4	41	2	0	1	1	2	1.4	7
24. Darwen	41,038	7	3	n.a.	0	1	1	0	0	10.5	44
25. Deptford	110,299	12	2	40	0	3	2	0	0	1.7	12
26. Derby	126,389	38	20	75	0	5	3	1	0	2.3	10
27. Dewsbury	54,314	5	11	35-50	2	0	1	0	0	6.1	18
28. Ealing	66,181	n.a.	n.a.	n.a.	1	0	1	0	0	1.7	10
29. Eastbourne	55,000	3	5	25	0	1	1	0	0	9.1	17
30. East Ham	142,582	n.a.	n.a.	42	2	1	1	1	0	2.4	8
31. Edmonton	71,674	18		n.a.	0	1	0	1	0	4.3 *	10
32. Finsbury	78,233	13	0	16	3	2	1	6	5	3.2	30

TABLE 8 (*continued*)

County Borough or District	Estimated Population	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	Municipal Infant Welfare Centres	Volunteer Infant Welfare Centres	Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
33. Fulham	158,600	18	3	63	2	1	0	1	1	2.6	14
34. Gillingham	45,058	n.a.	n.a.	n.a.	0	1	0	0	0	2.8	7
35. Gloucester	50,533	7	10	70	1	0	0	4	1	3.5	11
36. Greenwich	96,037	n.a.	n.a.	n.a.	n.a.	n.a.	1	1	0	1.6*	11
37. Hackney	224,095	32	0	50	1	0	0	1	0	1.6	18
38. Halifax	99,500	2	18	n.a.	1	1	1	0	1	5.1	16
39. Hammersmith	124,750	n.a.	n.a.	50	3	0	0	3	2	1.9	19
40. Hampstead	81,760	n.a.	n.a.	n.a.	0	2	0	3	0	3.7	16
41. Holborn	46,832	n.a.	n.a.	n.a.	0	1	0	3	3	1.5	32
42. Huddersfield	115,390	15	14	55	0	2	0	1	0	4.7	16
43. Ilford	84,581	2	6	20	0	2	0	2	0	3.3	6
44. Ipswich	77,200	7	1	50	1	1	1	1	1	3.7	11
45. Kensington	170,800	17	0	54	2	0	0	5	0	2.3	25
46. Kingston-upon-Hull	291,118	22	29	71	7	0	2	2	1	5.5	10
47. Leeds	461,246	18	24	40	9	10	0	9	9	4.4	16
48. Leicester	232,664	19	13	58	6	2	1	1	0	6.1	28
49. Leyton	131,342	31		45	0	1	0	0	0	3.0	9
50. Lincoln	55,226	5	2	50	2	0	1	0	0	5.9	7

TABLE 8 (*continued*)

County Borough or District	Estimated Population	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	Municipal Infant Welfare Centres	Volunteer Infant Welfare Centres	Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
51. Liverpool	772,595	205	31	78	17	31	2	14	9	3.1	14
52. London, City of	15,531	n.a.	n.a.	n.a.	0	1	1	0	0	5.4	42
53. London	4,516,612	501	79	25	n.a.	n.a.	n.a.	n.a.	n.a.	2.8	18
54. Manchester	754,531	129	32	50	42	0	0	6	6	3.7	18
55. Merthyr Tydfil	85,082	32	26	96	0	3	1	0	0	5.0	6
56. Middlesbrough	126,452	5	18	56	0	5	0	4	4	3.4*	7
57. Newcastle-upon-Tyne	278,107	16	14	32	7	0	0	7	3	3.7	9
58. Newport	87,817	26	25	88	3	1	0	5	0	7.3	7
59. Northampton	91,123	9	3	55	3	0	0	4	4	4.7*	15
60. Nottingham	269,119	19	23	70	7	0	7		0	3.4	26
61. Oldham	151,044	25	35	60-65	3	0	1	2	0	6.0	24
62. Oxford	54,748	9	11	n.a.	1	1	0	8	0	3.5	16
63. Paddington	141,946	n.a.	n.a.	n.a.	0	1	0	4	4	1.4	19
64. Poplar	160,839	n.a.	n.a.	n.a.	2	0	3	6	9	2.1	15
65. Portsmouth	251,825	26	13	62	3	0	2	0	0	5.2	12
66. Preston	111,936	17	31	64	4	0	4	1	0	7.8	35
67. Rhondda	170,637	n.a.	n.a.	n.a.	0	6	0	0	0	5.2	5
68. Rochdale	94,310	30	21	75	2	0	0	1	0	4.3	28

TABLE 8 (*continued*)

County Borough or District	Estimated Population	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	Municipal Infant Welfare Centres	Volunteer Infant Welfare Centres	Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
69. Rotherham	65,313	7	8	43	0	4	1	0	0	4.3	6
70. Salford	219,979	n.a.	n.a.	76	7	2	1	n.a.	n.a.	4.0	17
71. Sheffield	476,012	30	31	60	23	0	1	0	0	4.8	11
72. Shoreditch	109,155	12	0	70	2	0	3	2	2	3.9	31
73. Smethwick	72,439	3	33	100	0	5	4	0	4	3.0*	12
74. Southampton	125,500	17	12	70	2	5	0	2	0	4.1	10
75. Southend-on-Sea	87,225	12	1	39	1	0	1	0	1	6.3	11
76. Southport	67,700	12		n.a.	0	4	0	1	1	3.7	15
77. South Shields	110,604	9	7	n.a.	0	7	1	0	0	2.7	7
78. Southwark	179,424	n.a.	n.a.	n.a.	1	0	0	4	4	1.7	22
79. Stepney	265,731	n.a.	n.a.	n.a.	2	0	0	6	0	2.0	21
80. St. Helens	102,200	27	7	96		9	1	0	0	5.3	6
81. St. Marylebone	112,892	5		n.a.	1	3	0	5	2	2.1	26
82. Stockport	120,030	28	29	65	0	3	0	1	1	3.7	24
83. Stockton-on-Tees	59,311	5	6	49	2	0	1	0	0	4.7	7
84. Stoke-on-Trent	241,430	26	67	78	0	7	3	1	0	5.8	23
85. St. Pancras	212,497	n.a.	n.a.	31	0	3	0	9	9	2.3	19
86. Sunderland	152,931	8	15	60	6	0	0	6	0	4.0	8
87. Swansea	126,100	33	30	n.a.	1	0	0	1	0	5.7	8

TABLE 8 (*continued*)

County Borough or District	Estimated Population	Registered Midwives Trained	Registered Midwives Untrained	% of Births Attended by Midwives	Personnel Employed In Infant & Maternal Welfare Work Full Time	Personnel Employed In Infant & Maternal Welfare Work Part Time	Municipal Infant Welfare Centres	Volunteer Infant Welfare Centres	Ante-Natal Care Clinics or Consultations	Maternal Mortality Rate 1915	% of Married or Widowed Women in Employment
88. Tottenham	149,495	24	0	50	3	1	2	0	0	2.7	11
89. Tynemouth	61,408	2	8	41	2	2	1	0	1	3.9	9
90. Wakefield	53,000	3	11	52	0	4	3	0	0	5.8	8
91. Wallasey	90,000	47	3	73	1	2	0	1	1	3.3	10
92. Wandsworth	338,998	30	10	48	1	2	0	4	0	2.5	11
93. Warrington	75,532	10	16	72	n.a.	n.a.	2	2	2	3.1	11
94. West Bromwich	70,056	18	14	92	1	2	1	2	2	2.5	8
95. West Ham	301,102	55	8	60	0	4	0	5	2	2.1	11
96. West Hartlepool	65,000	2	5	32	0	2	1	0	0	7.0	7
97. Westminster, City of	150,000	10	0	28	3	26	0	3	3	4.5	28
98. Wigan	90,842	27	22	85	4	0	2	0	0	9.7	12
99. Willesden	166,840	24		33	0	11	1	2	0	3.5	12
100. Wimbledon	56,409	n.a.	n.a.	n.a.	1	1	0	3	3	3.0	11
101. Wolverhampton	95,817	6	22	50	2	1	2	0	0	3.4	13
102. Woolwich	140,000	n.a.	n.a.	n.a.	0	2	1	0	0	3.2	10
103. York	83,380	13	18	65	2	0	0	2	2	2.8	10

* Maternal Mortality Rate, 1914. All such rates refer to deaths per 1,000 deliveries per year.

Source: E.W. HOPE, *Report on the Physical Welfare of Mothers and Children*. Vol. 1 (1917), Epitomes of County Reports.