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Mortality in Childbed, both in Hospital and in General Practice.*

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SINCE the year 1893, when I first drew attention to the persistent death-rate of childbirth throughout England and Wales, and in London and the Provinces,¹ I have frequently been appealed to to furnish data of the later years; and, though, in dealing with fever in childbed² before this Society in 1890, I recorded the deaths which had taken place in the York Road Hospital during the period then under review, no complete record up to the present exists in our *Transactions*.

On the present occasion, I propose to bring both up to date, and to put the mortality figures both from the hospital records and from the returns of the Registrars General, in such a form that they can be readily compared; and to deal not only with the mortality of childbirth but also with the whole of the mortality in childbed.

The mortality of childbirth includes the deaths from:—

1. Puerperal septic disease, variously returned in the reports of the Registrars General as from puerperal septicæmia, puerperal pyæmia, phlegmasia alba dolens, and puerperal fever or metria.
2. Accidents of childbirth returned under the heads of abortion and miscarriage, puerperal mania, puerperal convulsions, placenta prævia and flooding; and other accidents of pregnancy and childbirth.

The mortality in childbed includes also other incidental causes of

* Read at a Meeting of the Obstetrical Society of London, May, 1905.

death occurring in connection with pregnancy and childbirth. A record of these causes of death is now available, and is given for England and Wales for the three years 1901—3, but not for the other divisions of the kingdom. From the hospital records, I am able to lay before the Society the mortality in childbed for three periods: 1833—1860, 1861—1877, and 1879—1904 (Table A). But it is impossible to state separately the mortality of childbed for the earlier of these periods, though it is known that puerperal septic disease was often rampant, and always played a prominent part in maintaining a high mortality. Indeed, owing to the influence of sepsis, the mortality, on occasion, reached an appalling figure.

But since the hospital was re-opened in October, 1879, it has been possible to give the figures for puerperal sepsis, for accidents of childbirth, and for incidental causes; and thus to estimate separately the mortality in childbed and the mortality of childbirth (Table B).

A record of the cause of death in each case is given in the form of an appendix (Appendix to Table B).

A hospital possessing such reputation as the York Road Hospital naturally attracts an undue proportion of serious cases, and many of the cases are sent into hospital, not only by neighbouring practitioners, but sometimes even from a distance. When, as often happens, cases come to hospital during the course of labour, and after prolonged and ineffectual attempts at delivery have already been made, sepsis is apt to be introduced with the patient, and a fatal result not infrequently takes place for which the hospital cannot justly be held responsible. All the fatal cases which have, in this way, been sent in from outside, are noted in a separate column of the Appendix to Table B, and are also separately recorded in the two succeeding Tables C and D. These tables record the mortality from puerperal sepsis during the last 25 years, distinguishing four periods, according to the antiseptic in general use.

It will be observed that for the last 16 years or more, among 8,373 confinements, no death from sepsis has taken place, when the case has been dealt with throughout in hospital, but that during this time, four patients (Nos. 22, 33, 34 and 50 in the Appendix) sent in after the manner above described, have died from septic disease. This, I look upon, as an important fact. For, these women were delivered and attended by the same midwives and nurses, and occupied the same labour wards and lying-in wards in close proximity to other patients; yet, the disease failed to spread—a sure indication, to my mind, of the efficiency of the routine measures

adopted to prevent the spread of infection, and the most convincing proof that puerperal sepsis is essentially a preventible disease.

The figures given in the above tables speak with greater eloquence than any mere words of mine, as to the excellence of the results which have been attained in this particular hospital. I am aware, and it is but fair that I should add, that such results have been equalled in other hospitals and maternities.

Before dealing with the means by which such results have been attained, I would explain that, since I occupied the position of House Physician and of Physician to the out-patients at the York Road Hospital during the years 1883-4-5, I have been personally acquainted with all the arrangements. Further, I have, by personal inquiry and by study of the Minutes of the Managing Committee, and the Annual Reports, become conversant with all the arrangements which have existed since the re-opening of the hospital in October, 1879. I am now engaged, in conjunction with our Honorary Secretary, in compiling a short history of the hospital for the last 25 years; and I have searched the records antecedent to that date.

The York Road Hospital is an old and, in many respects, inconvenient building, dating from the year 1830. Owing to the high mortality which usually prevailed, and which often reached alarming proportions, endeavours were made, by strictly limiting the admission of patients, and by ventilation of the wards, to improve the condition of the hospital. Thus, in 1841, £2,250 was spent on a ventilating apparatus, and year after year hundreds of pounds were, in addition, spent on improving and maintaining it. Even then, in October, 1878, Professor de Chaumont reported that he attributed the insanitary state of the hospital, in great measure, to defective ventilation. Thousands more were then spent on improving the apparatus; but it proved so unsatisfactory that it has been abandoned and recourse has been made to open windows and a fire maintained in an open fire-place in each ward. The net result of the endeavours made to improve the condition of the hospital by attempts (not very satisfactory) at ventilation, may be gauged by reference to Table A. This table shows that the mortality of the hospital from 1833 to 1860 averaged 1 in 32 deliveries, *i.e.*, 3·08 per cent.; and from 1861 to 1877, 1 in 58, *i.e.*, 1·69 per cent.

No separate account of the amount of puerperal sepsis is available, but it is known that so-called epidemics of puerperal fever were of frequent occurrence, and that the mortality from this cause, always considerable, at times became appalling. For instance, in

1877, out of 63 patients delivered, 9 died. In consequence, it was decided to close the hospital.

After certain structural alterations, in which an attempt was made to improve the ventilation as above described, had been effected, the hospital was re-opened in October, 1879. A Committee, composed of the visiting staff, presided over by the present Lord Lister, drew up a set of antiseptic rules, which were adopted by the Committee of Management. These rules have, from time to time, been revised, but the general principles have remained the same. The details only have been changed.

The result is set forth in Tables C and D, which give the mortality from puerperal sepsis in relation to the number of deliveries, in four periods, according to the general antiseptic in use. I dealt with this matter in detail in the paper which I read before this Society in 1890, to which reference has already been made. It is sufficient here to add that, while strictly maintaining the general principles of disinfection, and while endeavouring to maintain in the hospital a condition of rigid asepsis, by regarding every attendant—nurse, midwife or doctor—as a potential purveyor of infection, and by regarding every patient on admission as possibly having in and about the lower parturient passages pathogenic organisms, it has been found possible to abrogate many of the details at one time insisted upon without impairing the efficiency of the methods adopted. For instance, routine douching during the greater part of the puerperium has been given up, and the douche is now used once only, on the fifth day; both the labour and lying-in wards have been fumigated less frequently and formalin substituted for sulphur; the washing of the walls and furniture with carbolic lotions has been discontinued altogether; and more patients are now put to bed in the same ward-space than formerly. But, as I explained before in dealing with the question of morbidity, the results obtained under the use of corrosive sublimate have been so satisfactory, and an attempt made to substitute salufer in a selected number of cases proved so disastrous, that my colleague and I have hesitated to adopt any other antiseptic in its place.

From what one often sees, and from what one ascertains by inquiry into the circumstances of individual cases of failure to maintain an aseptic condition in private practice, I cannot help thinking that failure is mainly due to a want of application of the fundamental principles of asepsis. It is not the fault of this or that antiseptic, so much as a failure to grasp the important details pertaining to the use of any antiseptic, which leads to failure. As I

said in my previous paper: "It is not the mere use of antiseptics, but the method of using them, and the faithful carrying out of details concerning their application, which calls forth their special value." Indeed, I think it highly probable, that during the first period of the antiseptic régime in the York Road Hospital, had the care at present exercised in the use of sublimate solutions, been used in the employment of carbolic lotions as the general antiseptic, the results would have been little, if anything, short of those subsequently attained.

The use of salufer and its disastrous effect has proved a valuable object lesson, and a salutary warning to us not to adopt any of the numerous so-called antiseptics—and their name is legion—without a full trial of their efficiency, and a knowledge of the difficulties and pitfalls attendant upon their use. Not a few of the so-called antiseptics which have of recent years been placed upon the market, and extensively advertised, contain obvious chemical incompatibles. Others are of doubtful bactericidal potency—a mere delusion and a snare. I agree with *Truth*, that it is nothing less than a scandal that the sale as antiseptics of such articles should be permitted, until their germicidal powers have been ascertained beyond dispute.

With reference to the possibility of preventing puerperal sepsis in private practice, a despairing note has recently been sounded in Germany,³ a note which has found an echo in this country. The profession has been invited to turn its attention to the curative treatment of puerperal septic diseases, on such assumption as that in private practice it is impossible to prevent infection from without, or that the source of the disease is already stored away inside the patient before the onset of labour, and that it cannot be got at, or its ravages prevented. I am firmly convinced, for the following reasons, that both assumptions are wrong:—I hold that if these diseases can be prevented in hospital, where not many years ago the ravages of sepsis were far in excess of private practice; where the patients are brought into close contact, the healthy with the unhealthy; where the subjects are generally drawn from the less better circumstanced class; and where the least promising cases naturally gravitate—if, under these circumstances, septic disease can be practically eliminated, it certainly should be possible to eliminate also this grave source of mortality and morbidity from private practice. For, in private, the circumstances are less favourable to its spread, most of the cases are, to all intents and purposes, isolated, and many of the women who suffer are in easy circumstances, and are placed in the midst of healthy surroundings. Yet, what do we find?

In Tables E and F I have ranged side by side, for purposes of comparison, the deaths and the mortality of childbirth and in childbed at the York Road Hospital for the last 25 years, and in England and Wales for the only three years (1901—3) for which complete figures are available. I commend the comparison to the consideration of the Society, merely asking that the far more serious nature of the hospital cases be borne in mind, and also that due allowance be made for the fact that in the hospital record are included many years during which the methods of combating the disease were admittedly imperfect. But, in spite of this, the balance shows in favour of the hospital on every count, with the exception of inter-current diseases. Deaths occurring under the head of accidents of childbirth are less, and from septic diseases the deaths are very markedly less in hospital than in private. Had the last 16 years only of the hospital records been taken for comparison, the difference under the last-mentioned heading would be enormous. For, as previously mentioned, the only cases of sepsis which have occurred during that time have been four in number, and all these four cases have been introduced from without.

Now, for the cause of the difference and for the remedy. I hold now, as I held when I first drew attention to the persistent mortality of childbirth from sepsis 15 years ago, that a small proportion only of obstetric practice is at present in the hands of those who have been educated in the use of antiseptics, and even of those who make a practice of following out aseptic and antiseptic principles, but few do so in a really efficient manner. I agree with the weighty words which fell from the lips of our President in his Inaugural Address. If puerperal sepsis is to be eliminated it is necessary to go back to the root of the matter, and to instruct the student *practically and under proper supervision*,—as is done now, and for some years now has been done, in the case of the trained nurse and midwife, in the rudiments and essentials of asepsis, and to foster a true perception of the value and limitation of antiseptic agents; leaving the details to be varied by individual circumstances, but insisting that every essential point be strictly observed. For, as one weak link is apt to spoil the continuity of a chain, so the faulty application of aseptic and antiseptic principles in a single detail may lead to signal disaster.

To sum up. I have expressed, in relation to the number of deliveries at the York Road Hospital, the mortality in childbed for three different periods, ranging together over seventy years. For the last twenty-five years I have given a record of each fatality,

and I have for that period been able to differentiate,—by including under a separate heading all the incidental causes of death, the mortality of childbirth from the mortality in childbed; and, for that period also, I have separated the deaths from puerperal septic diseases from the accidents of childbirth. I have indicated the changes and improvements which have been effected in the hospital service during the whole of the period under review. I have shown the improvement in the condition of the hospital which has been effected, gradually at first, but rapidly during the use of antiseptics; and particularly I have shown that septic diseases have been successfully combated even when introduced by patients directly into the wards of the hospital.

I have shown, on the other hand, that in obstetric practice generally throughout England and Wales, the mortality of childbirth remains persistently high, and that deaths from septic diseases have certainly not diminished. I have expressed my firm conviction that this lamentable loss of life is remediable, and that septic diseases as a cause of death from childbirth are preventible, and I have suggested the lines along which improvement can be effected by insisting on the practical instruction of the midwifery student, as well as midwives and nurses, in the essentials of asepsis and the use of antiseptics.

Finally, as showing the variation in the mortality of childbirth from year to year, and how little advance, as evidenced by the mortality statistics, is as yet apparent in obstetric practice generally, I have prepared the following tables and charts. For this purpose, I have laid under contribution the reports of the Registrars-General. It may be objected that, owing to faulty registration and to defective death-certification, the returns are not reliable. That this objection may have some weight in estimating the amount of mortality, especially as regards puerperal sepsis (in which, for obvious reasons, the death returns are avowedly defective), I fully admit, but, as by these data it is sought to compare the mortality of one year with that of another, and of one part of the kingdom with another (and these sources of error apply to each), the result cannot be materially affected. In estimating the true amount of mortality, however, a mental correction should certainly be made for the obvious source of error.

These Tables and Charts represent the mortality of childbirth for London, and for each division of the kingdom. The figures go back as far as the returns given in the reports of the Registrars General, and onwards to include the year 1903. I regret that it has been impossible to include the figures for the northern division of Great Britain for the same year; and the Registrar General for Scotland

informs me that it will yet be some months before they will be available.

As in my original communication on the mortality of childbirth, the death-rates have been estimated according to the number of registered births; these, on the one hand, take no account of multiple pregnancies; and on the other, are exclusive of still-born children. The registered births provide a fairly correct index of the number of deliveries, so that by adopting the plan of calculating the death-rate in relation to them, a fair estimate can be obtained of the mortality associated with child-bearing; and, at any rate, the results year by year are strictly comparable.

In Charts A, B, C and D, which deal respectively with London, England and Wales, Scotland and Ireland, the mortality for each year has been presented by placing upon the base line the death-rate from puerperal sepsis, and above this, the death-rate from accidents of childbirth. The distance from the base line to the upper limit of the diagram, accordingly measures the death-rate of childbirth from all causes. The total mortality, and the mortality from puerperal sepsis, may be read on the scale in relation to 10,000 confinements.

In Charts E, F and G, on the other hand, the total mortality and the death-rate for each year from puerperal sepsis, and from accidents of childbirth, are represented separately, each upon its own base, in such a manner as to bring into comparison the mortality for London, and for each division of the kingdom.

Before preceding to consider the evidence afforded by these Tables and Charts, it should be mentioned that, since 1881, special inquiries have been instituted by the Registrar General (in England and Wales, but I have no information if it applies equally to Scotland and Ireland) in all cases where a death is returned in connection with pregnancy or childbirth, and doubt exists as to whether it should be rightly included in the deaths associated with child-bearing, either as a result of puerperal sepsis or of one or other of the accidents of childbirth. As the result of the inquiries thus instituted, an addition roughly estimated at one-twelfth of the return has been made. In instituting a comparison between the years before and after that date, this addition should be borne in mind. In spite of this addition, the Registrar General reports that even yet grave doubt exists as to the figures given under the head of "Puerperal Septic Diseases" being regarded as fully representative of the mortality actually occurring under that head.

In studying these charts it will be observed that the curve

representing the mortality from the accidents of childbirth has an undoubted tendency to follow the curve of the death-rate from septic diseases. This is due, doubtless, to the fact that no inconsiderable proportion of cases returned as dying from accidents, are complicated by sepsis in some form or other, and that the returns are for obvious reasons preferably made in such complicated cases under the head of "Accidents."

In each chart a mean has been drawn both for puerperal sepsis and for the mortality of childbirth from all causes, one up to the year 1880, and the other from 1881 onwards. In Table K the mean mortality has been separately set out. It will be noticed that at certain periods, considerable deviation from the mean has taken place in each chart. It is possible that at these times some wide-spread influence may be at work to account for such variations; but that is a separate matter which I propose to deal with in a subsequent communication to the Society.

In concluding my paper on the Morbidity of Childbirth 12 years ago, I said: "The reduction of puerperal mortality on any considerable scale is yet a dream of the future, and it must take years before that dream will be fully realised. Already encouraging signs are apparent, in so far that the rise in the death-rate from puerperal fever which has taken place during the last decade in the provinces has not attained corresponding proportions in the metropolis. In London and the larger towns, where antiseptic measures are naturally more freely adopted, improvement may first be looked for, and that the provinces will shortly follow suit may be confidently anticipated."

The lapse of twelve years, and a study of the statistics of this additional period, has tended to confirm the impression to which I then gave utterance. It will be found that in London alone has any marked reduction either in the deaths from accidents or from puerperal sepsis taken place. It would be interesting to have the data from Edinburgh and for Dublin for comparison with the whole of Scotland and the whole of Ireland. I hope this may be supplied on a future occasion.

From the tables and charts now given, the following conclusions are made:—

1. The total death-rate from childbirth has not diminished either in England or Wales, in Scotland or in Ireland, where it is abnormally high, as compared with the other divisions of the kingdom; but in London it has declined considerably.

2. The death-rate from accidents of childbirth has declined

slightly in each division of the kingdom, but is abnormally high in Ireland, and in London has markedly diminished.

3. The death-rate for puerperal septic diseases has, if anything, shown a tendency to increase in each division of the kingdom, but in London it has been declining for at least the last decade.

REFERENCES.

1. "The Mortality of Childbirth." *Lancet*, July 1, 1893.
2. "Fever in Childbed." Part I: General Hygiene and Antisepsis. *Trans. Obstet. Soc.*, Vol. xxxii., 1890.
3. Bumm (E.). *Berliner Klinische Wochenschrift*, October 31st, 1904, p. 1145. (See *Epitome of Brit. Med. Journ.*, January 21st, 1905).

TABLE A.—*Deliveries, Deaths, and Death-rate in Childbed at the York Road (General Lying-in) Hospital for three successive periods.*

Period.	Deliveries.	Deaths.	Death-rate from all causes.
1833 to 1860	5,833	180	1 in 32 = 3·08 per cent.
1861 to 1877	3,773	64	1 in 58 = 1·69 „
1879 to 1904	11,186	53	1 in 211 = 0·47 „

The hospital was closed for nearly two years—1878 and 1879

TABLE B.—*Deliveries, Deaths, and Death-rate in Childbed at the York Road (General Lying-in) Hospital for the twenty-five years 1879 to 1904.*

Year.	Deliveries.	Deaths (see Appendix) from			
		Sepsis.	Accidents of childbirth.	Incidental causes.	All causes.
1879	13	0	0	0	0
1880	165	1	1	1	3
1881	172	0	0	0	0
1882	325	2	1	0	3
1883	342	3	0	0	3
1884	334	1	0	0	1
1885	395	1	0	3	4
1886	383	0	1	0	1
1887	404	0	1	0	1
1888	497	2	0	0	2
1889	484	1	3	0	4
1890	430	0	0	1	1
1891	463	0	1	1	2
1892	490	0	0	0	0
1893	527	0	1	1	2
1894	535	0	3	1	4
1895	535	0	1	0	1
1896	508	2	0	0	2
1897	520	0	0	1	1
1898	546	0	3	2	5
1899	560	0	2	1	3
1900	500	0	1	0	1
1901	497	0	1	3	4
1902	480	0	1	0	1
1903	556	1	2	0	3
1904	525	0	0	1	1
Total	11,186	14	23	16	53
Death-rate for the 25 years		1 in 799 = 0·12 %	1 in 486 = 0·20 %	1 in 699 = 0·14 %	1 in 211 = 0·47 %

APPENDIX TO TABLE B.—Deaths in Childbed at the York Road (General Lying-in) Hospital for the twenty-five years 1879 to 1904.

Year.	No.	Cause of Death.	Sent in
1880	1	Pneumonia; syphilitic ulceration of larynx	—
"	2	Eclampsia	—
"	3	Septicæmia; abscess in uterine wall, result of injury before delivery	—
1882	4	Mania.	—
"	5	Septicæmia after placenta prævia	By medical attendant.
"	6	Septicæmia; suppurating cyst (probably dermoid). Craniotomy and aspiration of cyst	—
1883	7	Septicæmia	—
"	8	Septicæmia; phlebitis and acute endocarditis	—
"	9	Septicæmia, suppurating hæmatoma	—
1884	10	Septicæmia, phlebitis and acute endocarditis, after tedious labour with contracted pelvis and post-partum hæmorrhage	—
1885	11	Advanced pulmonary phthisis	By medical attendant.
"	12	Advanced pulmonary phthisis	—
"	13	Mercurialism and morphism	—
"	14	Septicæmia, phlebitis and general pyæmia after post-partum hæmorrhage	—
1886	15	Eclampsia	—
1887	16	Eclampsia	—
1888	17	Septicæmia, sloughing of soft parts after unsuccessful attempts to deliver with forceps and cephalotripsy	By medical attendant.
"	18	Septicæmia; hospital gangrene	—
1889	19	Accidental and post-partum hæmorrhage	From hospital district.
"	20	Accidental and post-partum hæmorrhage	—
"	21	Accidental hæmorrhage	—
"	22	Septicæmia; suppurative pyelitis. Cæsarean section for contracted pelvis	By medical attendant.
1890	23	Cancer of uterus. Cæsarean section after four days' labour	By medical attendant.
1891	24	Rupture of uterus; hydrocephalic head	By medical attendant.

APPENDIX TO TABLE B—*continued.*

Year.	No.	Cause of Death.	Sent in.
1891	25	Heart disease, syncope, placenta prævia	By medical attendant.
1893	26	Advanced pulmonary phthisis	—
"	27	Eclampsia	—
1894	28	Rupture of pelvic abscess. Cephalotripsy for contracted pelvis	From hospital district.
"	29	Eclampsia	—
"	30	Hæmorrhage from placenta prævia	By medical attendant.
"	31	Mercurialism	—
1895	32	Rupture of uterus. Cephalotripsy for contracted pelvis	By medical attendant.
1896	33	Septicæmia after placenta prævia	From hospital district.
"	34	Septicæmia after high forceps for contracted pelvis	By medical attendant.
1897	35	Sudden death; probably cerebral apoplexy	—
1898	36	Rupture of uterus	—
"	37	Acute general tuberculosis. Miscarriage	By medical attendant.
"	38	Acute yellow atrophy of liver. Convulsions; cephalotripsy	—
"	39	Hæmorrhage from placenta prævia and uterine fibroid	—
"	40	Hepatic abscess and gall-stones. Convulsions	By medical attendant.
1899	41	Accidental hæmorrhage	From hospital district.
"	42	Eclampsia; cerebral apoplexy	—
"	43	Advanced pulmonary phthisis	—
1900	44	Eclampsia after cephalotripsy	By medical attendant.
1901	45	Eclampsia	—
"	46	Advanced pulmonary phthisis	—
"	47	Tuberculous kidneys, bladder and vagina	By medical attendant.
"	48	Acute lobar pneumonia	—
1902	49	Exhaustion following protracted labour with contracted pelvis	—
1903	50	Septicæmia after protracted labour	By medical attendant.
"	51	Eclampsia	By medical attendant.
"	52	Placenta prævia and post-partum hæmorrhage	—
1904	53	Heart disease, syncope, placenta prævia	—

TABLE C.—*Deaths from Septicæmia at the York Road (General Lying-in) Hospital during four periods in which different antiseptics were used.*

Period and Antiseptic.	Deliveries.	Deaths from septicæmia.	
		Including those sent in.	Excluding those sent in.
1. October, 1879, to April, 1884. CARBOLIC ACID AND CONDY'S FLUID	1111	7	6
2. May, 1884, to August, 1888. CORROSIVE SUBLIMATE	1715	1	1
3. August to October, 1888. CORROSIVE SUBLIMATE AND SALUFER	87*	2	1
4. October, 1888, to December, 1904. CORROSIVE SUBLIMATE	8373	4	0
October, 1879, to December, 1904. WHOLE ANTISEPTIC PERIOD	11,186	14	8

* In ten of these cases sublimate solution was used entirely.

TABLE D.—*Death-rate from Septicæmia at the York Road (General Lying-in) Hospital during four periods in which different antiseptics were used.*

Period and Antiseptic.	Death-rate from septicæmia.	
	Including those sent in.	Excluding those sent in.
1. October, 1879, to April, 1884. CARBOLIC ACID AND CONDY'S FLUID	1 in 158 =0·63 %	1 in 185 =0·54 %
2. May, 1884, to August, 1888. CORROSIVE SUBLIMATE	1 in 1715 =0·05 %	1 in 1715 =0·05 %
3. August to October, 1888. CORROSIVE SUBLIMATE AND SALUFER	1 in 43 =2·29 %	1 in 87 =1·14 %
4. October, 1888, to December, 1904. CORROSIVE SUBLIMATE	1 in 2068 =0·04 %	None
October, 1879, to December, 1904. WHOLE ANTISEPTIC PERIOD	1 in 799 =0·12 %	1 in 1398 =0·07 %

TABLE E.—*Deliveries and Deaths from Puerperal Sepsis and Accidents of Childbirth (together giving the DEATHS FROM CHILDBIRTH), and from Incidental Causes occurring in connection with Pregnancy and Childbirth (together giving the DEATHS IN CHILDBED) for twenty-five years—1879 to 1904—at the York Road Hospital, and for three years—1901 to 1903—in England and Wales.*

<i>York Road Hospital, England & Wales,</i>			
	1879—1904		1901—1903
Deliveries and births registered ...	11,186	...	2,818,577
Deaths from puerperal sepsis	14	...	5,750
„ „ accidents of childbirth	23	...	6,706
„ FROM CHILDBIRTH	37	...	12,456
„ from incidental causes.....	16	...	3,590
„ IN CHILDBED	53	...	16,046

A statement of the fatal cases occurring in connection with pregnancy and childbirth in England and Wales for the years 1901–3 is given in the form of an Appendix to Table E.

A statement of the fatal cases occurring in the York Road Hospital for the twenty-five years 1879–1904 has already been given in the Appendix to Table B.

APPENDIX TO TABLE E.

Deaths of Women in England and Wales in 1901, 1902, and 1903 definitely returned as either caused by, or associated with, Pregnancy or Childbearing.

<i>Births in three years, 1901-3</i>	2,818,577
<i>Deaths from puerperal sepsis</i>	5,750
" " <i>accidents of childbirth</i>	6,706
" " <i>incidental causes</i>	3,590
" " <i>all causes</i>	16,046

Cause of Death.

Small-pox	52	Pericarditis	6
Measles	10	Hypertrophy and dilatation of heart	20
Scarlet fever	78	Fatty degeneration of heart	33
Influenza	191	Syncope, heart disease (not specified)	289
Diphtheria	18	Cerebral hæmorrhage	9
Pyrexia (origin uncertain)	1	Apoplexy, hemiplegia	17
Enteric fever	61	Laryngitis	9
Diarrhoea, dysentery	41	Bronchitis	129
Syphilis	11	Emphysema, asthma	11
Puerperal septicæmia	4212	Pleurisy	29
Puerperal pyæmia	129	Other diseases of respiratory system	18
Phlegmasia alba dolens	256	Disease of mouth, pharynx	5
Puerperal fever	1153	Tonsillitis	1
Infective endocarditis	9	Gastric ulcer	28
Lobar pneumonia	107	Other diseases of stomach	29
Bronchopneumonia	75	Enteritis	33
Pneumonia (not defined)	647	Appendicitis	1
Tuberculous phthisis	102	Intestinal obstruction	27
Phthisis (not otherwise defined)	326	Diseases of liver	33
Tuberculous meningitis	4	Diseases of thyroid body	9
Tuberculous peritonitis	11	Acute nephritis	179
General tuberculosis, and other tuberculous diseases	38	Chronic Bright's disease	345
Alcoholism	11	Other diseases of urinary system	12
Rheumatic fever	48	Ovarian tumour	8
Chronic rheumatism	1	Uterine tumour and other diseases of uterus	38
Malignant disease	28	Abortion, miscarriage	452
Purpura	7	Puerperal mania	211
Anæmia	84	Puerperal convulsions	1185
Diabetes mellitus	13	Placenta prævia, flooding	2014
Meningitis, inflammation of brain	9	Other accidents of pregnancy and childbirth	2844
Chorea	11	Other causes	26
Epilepsy	47		
Other diseases of nervous system	12		
Valvular disease, endocarditis	186		

TABLE F.

Death-rate from Puerperal Sepsis and Accidents of Childbirth (together giving the MORTALITY FROM CHILDBIRTH) and from Incidental Causes occurring in connection with Pregnancy and Childbirth (together giving the MORTALITY IN CHILDBED) for 25 years—1879–1904—at the York Road Hospital, and for 3 years—1901–1903—in England and Wales.

	York Road Hospital. 1879–1904.	England and Wales. 1901–1903.
Death-rate from puerperal sepsis	1 in 799 = 0·12 %	1 in 490 = 0·20 %
Death-rate from accidents of childbirth	1 in 486 = 0·20 %	1 in 420 = 0·23 %
MORTALITY OF CHILDBIRTH .	1 in 302 = 0·33 %	1 in 226 = 0·44 %
Death-rate from incidental causes	1 in 699 = 0·14 %	1 in 785 = 0·12 %
MORTALITY IN CHILDBED	1 in 211 = 0·47 %	1 in 175 = 0·56 %

TABLE G.

Death-rate of Childbirth in London from Puerperal Fever or Metria, from Accidents of Childbirth, and from all Causes, estimated for 10,000 Children born alive.

Year.	Births, excluding stillborn children.	Deaths from childbirth from—			Childbirth death-rate from—		
		Puerperal sepsis.	Accidents of childbirth.	All causes.	Puerperal sepsis.	Accidents of childbirth.	All causes.
1848	71,265	321	250	571	45·0	35·0	80·1
1849	72,662	258	244	502	35·5	33·5	69·0
1850	74,317	199	244	443	26·7	32·8	59·6
1851	77,871	180	231	411	23·1	29·6	52·7
1852	80,484	188	262	450	23·3	32·5	55·9
1853	83,878	140	252	392	16·6	30·0	46·7
1854	84,684	172	263	435	20·3	31·0	51·3

TABLE G—*continued.*

Year.	Births, excluding stillborn children.	Deaths from childbirth from—			Childbirth death-rate from—		
		Puerperal sepsis.	Accidents of child- birth.	All causes.	Puerperal sepsis.	Accidents of child- birth.	All causes.
1855	84,944	199	272	471	23·4	32·0	55·4
1856	86,833	170	246	416	19·5	28·3	47·9
1857	91,048	136	227	363	14·9	24·9	39·8
1858	88,620	165	265	430	18·6	29·9	48·5
1859	92,556	207	267	464	22·3	27·7	50·1
1860	92,825	145	254	399	15·6	27·3	42·9
1861	96,389	162	234	396	16·8	24·2	41·0
1862	97,418	190	241	431	19·5	24·7	44·2
1863	103,897	220	339	559	21·1	32·6	53·8
1864	102,187	261	315	576	25·5	30·8	56·3
1865	106,722	182	300	482	17·0	28·1	45·1
1866	107,992	153	316	469	14·1	29·2	43·4
1867	112,264	157	297	454	13·9	26·4	40·4
1868	115,744	219	275	494	18·9	23·7	42·6
1869	111,930	198	259	457	17·6	23·1	40·8
1870	113,499	217	306	523	19·0	26·9	46·0
1871	112,535	182	318	500	16·1	28·2	44·3
1872	117,200	251	253	504	21·4	21·5	43·0
1873	121,100	306	326	632	25·2	26·9	52·1
1874	121,394	466	335	791	37·5	27·5	65·0
1875	122,875	304	324	628	24·7	26·3	51·1
1876	127,015	255	354	609	20·0	27·8	47·9
1877	127,257	217	289	506	17·0	22·7	39·7
1878	129,184	195	255	450	15·0	19·7	34·8
1879	134,096	194	245	439	14·4	18·2	32·7
1880	132,173	268	253	521	20·2	19·1	39·4
1881	132,674	332	228	560	25·0	17·1	42·2
1882	133,200	287	225	512	21·5	16·8	38·4
1883	133,656	307	180	487	22·9	13·4	36·4
1884	137,495	327	193	520	23·7	14·0	37·8
1885	132,506	323	182	505	24·3	13·7	38·1
1886	133,700	279	200	479	20·8	14·9	35·8
1887	133,075	323	163	491	24·6	12·2	36·8
1888	131,080	275	169	444	20·9	12·8	33·8
1889	131,487	222	166	388	16·8	12·6	29·5
1890	130,690	237	212	449	18·1	16·2	34·3
1891	134,003	222	286	508	16·5	21·3	37·9
1892	131,535	313	304	617	23·7	23·1	46·8
1893	132,975	352	335	687	26·4	25·1	51·6
1894	130,553	210	266	476	16·0	20·3	36·4
1895	133,715	208	212	420	15·5	15·8	31·4
1896	135,796	225	280	505	16·5	20·6	37·1
1897	133,618	215	229	444	16·0	17·1	33·2
1898	132,432	184	177	361	13·8	13·3	27·2
1899	133,120	209	217	426	15·7	16·3	32·0
1900	130,868	169	230	399	12·9	17·5	30·4
1901	131,278	184	219	403	14·0	16·6	30·6
1902	132,810	201	210	411	15·1	15·8	30·9
1903	130,906	170	197	367	12·9	15·0	28·0

TABLE H.

Death-rate of Childbirth in England and Wales from Puerperal Fever or Metria, from Accidents of Childbirth, and from All Causes, estimated for 10,000 children born alive.

Year.	Births, excluding stillborn children.	Deaths from childbirth from—			Childbirth death-rate from—		
		Puerperal sepsis.	Accidents of child-birth.	All causes.	Puerperal sepsis.	Accidents of child-birth.	All causes.
1847	539,965	784	2442	3226	14·5	45·2	59·7
1848	563,059	1365	2080	3445	24·2	36·9	61·2
1849	578,159	1165	2174	3339	20·1	37·6	57·7
1850	593,422	1113	2139	3252	18·7	36·0	54·8
1851	615,865	1009	2281	3290	16·3	36·8	53·4
1852	624,012	972	2275	3247	15·5	36·4	52·0
1853	612,391	795	2268	3063	12·9	37·0	50·0
1854	634,405	954	2055	3009	15·0	32·3	47·4
1855	635,043	1079	1900	2979	16·9	29·9	46·9
1856	657,453	1067	1821	2888	16·2	27·6	43·9
1857	663,071	836	1951	2787	12·5	29·4	42·0
1858	655,481	1068	2063	3131	16·2	31·4	47·7
1859	689,881	1238	2258	3496	17·9	32·7	50·6
1860	684,048	987	2186	3173	14·4	31·9	46·3
1861	696,408	886	2109	2995	12·7	30·2	43·0
1862	712,694	940	2137	3077	13·1	29·9	43·0
1863	727,417	1155	2433	3588	15·8	33·5	49·3
1864	740,275	1484	2532	4016	20·0	34·2	54·2
1865	748,089	1338	2490	3823	17·9	33·2	51·1
1866	753,870	1197	2485	3682	15·8	32·9	48·8
1867	768,349	1066	2346	3412	13·8	30·5	44·4
1868	786,858	1196	2307	3503	15·1	29·3	44·5
1869	773,381	1181	2102	3283	15·2	27·1	42·4
1870	792,787	1492	2383	3875	18·8	30·0	48·9
1871	797,428	1464	2471	3935	18·3	30·9	49·3
1872	825,907	1400	2403	3803	16·9	29·0	45·9
1873	829,778	1740	2375	4115	20·9	28·6	49·5
1874	854,956	3108	2819	5927	36·3	32·9	69·3
1875	850,607	2504	2560	5064	29·4	30·2	59·6
1876	887,968	1746	2396	4142	19·6	26·9	46·6
1877	888,200	1444	1999	3443	16·2	22·5	38·8
1878	891,838	1415	1885	3300	15·8	21·1	37·0
1879	880,389	1464	1876	3340	16·6	21·3	37·9
1880	881,643	1659	1833	3492	19·0	20·7	39·8
1881	883,642	2287	1940	4227	25·8	21·9	47·8
1882	889,014	2564	1960	4524	28·8	22·0	50·8
1883	890,722	2616	1892	4508	29·3	21·2	50·6
1884	906,750	2468	1879	4347	27·2	20·7	47·9

TABLE H—continued.

Year.	Births, excluding stillborn children.	Deaths from childbirth from—			Childbirth death-rate from—		
		Puerperal sepsis.	Accidents of child- birth.	All causes.	Puerperal sepsis.	Accidents of child- birth.	All causes.
1885	894,270	2420	2029	4449	27·0	22·6	49·7
1886	903,760	2078	1799	3877	22·9	19·9	42·8
1887	886,331	2450	1710	4160	27·6	19·2	46·9
1888	879,868	2386	1774	4160	27·1	20·1	47·2
1889	885,944	1852	1733	3585	20·9	19·5	40·4
1890	869,937	1956	2299	4255	22·4	26·4	48·9
1891	914,157	1973	2814	4787	21·5	30·6	52·2
1892	897,957	2356	2838	5194	26·2	31·6	57·8
1893	914,572	3023	2927	5950	30·0	32·0	65·1
1894	890,289	2167	2608	4775	24·3	29·2	53·6
1895	922,291	1849	2370	4219	20·0	25·6	45·7
1896	915,331	2053	2508	4561	22·4	27·3	49·8
1897	921,683	1836	2414	4250	19·9	26·1	46·1
1898	923,165	1707	2367	4074	18·4	25·6	44·1
1899	928,646	1903	2418	4326	20·5	26·0	46·6
1900	927,062	1941	2514	4455	20·9	27·1	48·1
1901	929,807	2079	2315	4394	22·3	24·8	47·3
1902	940,509	2003	2202	4205	21·2	23·5	44·7
1903	948,271	1668	2189	3857	17·5	23·0	40·6

TABLE I.

Death-rate of Childbirth in Scotland from Puerperal Fever or Metria from Accidents of Childbirth, and from All Causes, estimated for 10,000 Children born alive.

Year.	Deaths from childbirth from—				Childbirth death-rate from—		
	Births, excluding stillborn children.	Puerperal sepsis.	Accidents of child- birth.	All Causes.	Puerperal sepsis.	Accidents of child- birth.	All causes.
1855	93,349	189	841	510	18·1	36·5	54·6
1856	101,822	143	851	494	14·0	34·4	48·5
1857	103,416	145	304	449	14·0	29·3	43·3
1858	104,018	152	302	454	14·6	29·0	43·6
1859	106,543	175	333	508	16·4	31·2	47·6

TABLE I—*continued.*

Year.	Deaths from childbirth from—				Childbirth death-rate from—		
	Births, excluding stillborn children.	Puerperal sepsis.	Accidents of child-birth.	All Causes.	Puerperal sepsis.	Accidents of child-birth.	All Causes.
1860	105,629	236	328	564	22·8	31·0	53·3
1861	107,009	203	308	511	18·9	28·7	47·7
1862	107,009	130	305	435	12·1	28·4	40·6
1863	109,341	195	376	571	17·8	34·3	52·2
1864	112,333	254	374	628	22·6	33·2	55·9
1865	113,070	213	422	635	18·8	37·3	56·1
1866	113,687	181	356	537	15·9	31·3	48·1
1867	114,044	163	321	484	14·2	28·1	42·4
1868	115,514	140	354	494	12·1	30·6	42·7
1869	113,354	153	410	563	14·3	36·1	49·6
1870	115,390	202	381	583	17·5	33·0	50·4
1871	116,128	225	420	645	19·3	36·1	55·5
1872	118,765	219	391	610	18·4	32·9	51·3
1873	119,700	251	325	576	20·9	27·1	48·1
1874	123,711	378	442	820	30·5	35·7	66·2
1875	123,578	389	459	848	31·4	37·1	68·6
1876	126,534	231	374	605	18·2	29·5	47·8
1877	126,822	163	394	557	12·8	31·0	43·9
1878	126,773	164	380	544	12·9	29·9	42·9
1879	125,730	184	397	581	14·6	31·5	46·2
1880	124,570	185	416	601	14·8	33·3	48·2
1881	126,171	235	462	697	18·6	36·6	55·2
1882	126,158	267	403	670	21·1	31·9	53·1
1883	124,458	363	427	790	29·1	34·3	63·3
1884	129,157	336	371	707	26·0	28·7	54·7
1885	126,100	374	405	779	31·2	34·0	61·7
1886	127,890	270	231	501	21·1	25·9	47·0
1887	124,418	275	338	613	22·1	27·1	49·2
1888	123,269	309	351	660	24·2	28·4	53·5
1889	122,783	277	346	623	22·5	28·1	50·8
1890	121,526	324	363	687	26·6	29·0	56·5
1891	125,986	378	340	718	30·0	26·9	56·9
1892	125,043	315	373	688	25·1	29·8	55·0
1893	127,110	252	336	588	19·8	26·4	46·2
1894	124,367	285	342	627	22·9	27·4	50·4
1895	126,494	253	355	608	20·0	28·0	48·0
1896	129,172	220	357	577	17·0	27·6	48·2
1897	128,877	205	331	536	15·9	25·6	41·5
1898	130,861	227	351	578	17·3	26·8	44·1
1899	130,733	214	341	555	16·3	26·0	42·4
1900	131,401	225	342	567	17·1	26·0	43·1
1901	132,192	158	340	498	11·9	25·7	38·4
1902	132,267	198	363	561	14·9	27·4	42·4

TABLE J.

Death-rate of Childbirth in Ireland from Puerperal Fever or Metria, from Accidents of Childbirth, and from All Causes, estimated for 10,000 Children born alive.

Year.	Births, excluding stillborn children.	Deaths from childbirth from—			Childbirth death-rate from—		
		Puerperal sepsis.	Accidents of child-birth.	All causes.	Puerperal sepsis.	Accidents of child-birth.	All causes.
1864	136,414	273	606	879	20.0	44.4	64.4
1865	144,970	284	644	928	19.5	44.4	64.0
1866	146,090	328	667	995	22.4	45.6	68.1
1867	144,388	302	620	922	20.9	42.9	63.8
1868	146,051	264	676	940	18.0	46.2	64.3
1869	145,659	303	650	953	20.8	44.6	65.4
1870	149,848	360	670	1030	24.0	44.7	68.7
1871	151,355	394	616	1010	26.0	40.6	66.7
1872	149,278	307	637	944	20.5	42.6	63.2
1873	144,377	275	493	768	19.0	34.0	53.1
1874	141,328	333	602	935	23.5	42.6	66.2
1875	138,320	442	563	1005	31.9	40.7	72.6
1876	140,469	414	591	1005	29.4	42.0	71.5
1877	139,659	377	581	958	26.9	42.6	68.5
1878	134,117	315	558	873	23.4	41.6	65.0
1879	135,328	340	571	911	25.1	42.1	67.3
1880	128,086	347	544	891	27.0	42.4	69.5
1881	125,847	354	462	816	28.1	36.7	64.8
1882	122,648	407	544	951	33.1	44.3	77.5
1883	118,163	307	479	786	25.8	40.5	66.5
1884	118,875	300	513	813	25.2	43.1	68.3
1885	115,951	370	495	865	31.9	42.6	74.6
1886	113,927	332	479	811	29.1	42.0	71.1
1887	112,400	316	510	826	28.0	45.3	73.4
1888	109,557	345	501	846	31.4	45.7	77.2
1889	107,841	268	454	722	24.8	42.0	66.9
1890	105,254	252	440	692	23.9	41.7	65.7
1891	108,116	236	421	657	21.8	38.9	60.7
1892	104,234	275	403	678	26.3	38.6	65.0
1893	106,082	364	420	804	36.1	39.5	75.7
1894	105,354	454	412	866	43.0	39.1	82.1
1895	106,113	321	448	769	30.2	42.2	72.4
1896	107,641	252	427	679	23.4	39.6	62.1
1897	106,664	228	468	696	21.3	43.8	65.2
1898	105,457	179	381	560	16.9	36.1	53.1
1899	103,900	210	391	601	20.2	37.6	57.8
1900	101,459	223	422	650	22.5	41.5	64.0
1901	100,976	220	404	624	21.7	40.0	61.7
1902	101,863	220	415	685	21.5	40.7	62.2
1903	101,831	233	340	573	32.7	33.3	66.0

TABLE K.

The Mean Mortality from Childbirth and from Puerperal Sepsis and Accidents of Childbirth in London, England and Wales, Scotland, and Ireland, before 1880 and after 1881.*

	Puerperal sepsis.	Accidents of childbirth.	Childbirth, from all causes.
LONDON—			
33 years (1848-1880) . . .	21.2	27.3	48.5
23 " (1881-1903) . . .	18.8	16.5	35.4
ENGLAND AND WALES—			
34 years (1847-1880) . . .	17.6	31.0	48.7
23 " (1881-1903) . . .	23.7	24.6	48.4
SCOTLAND—			
26 years (1855-1880) . . .	17.5	32.1	49.8
22 " (1881-1902) . . .	21.3	28.5	50.0
IRELAND—			
17 years (1864-1880) . . .	23.4	42.5	66.0
23 " (1881-1903) . . .	26.9	40.2	67.1

* Per 10,000 births.

Note.—In Charts I, II, III, and IV puerperal sepsis has been placed on the base line, and, on top of it, accidents of childbirth. The upper limit of the diagram from the base line represents the total mortality from childbirth. The upper broken line gives the mean death-rate from childbirth before 1880 and after 1881. The lower broken line gives the mean deathrate from puerperal sepsis before 1880 and after 1881.

In Charts V, VI, and VII the readings are all from the base-line.

CHART I.—London..

CHART II.—*England and Wales.*

CHART III.—Scotland.

CHART IV.—Ireland.

CHART V.—Childbirth Death-rate in London, England and Wales, Scotland and Ireland.

CHART VI.—Death-rate from Accidents of Childbirth in London, England and Wales, Scotland and Ireland.

CHART VII.—Death-rate from Puerperal Sepsis in London, England and Wales, Scotland and Ireland.