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ORIGINAL ARTICLES.

THE DEATH-RATE OF LYING-IN HOSPITALS IN THE UNITED STATES.¹

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STATISTICS showing the death-rate in general hospitals, while interesting and instructive in themselves, are of little value for purposes of comparison, for the class of cases treated in one institution can differ so much from that in another as to make any comparison between the two impossible. This is true to a much less degree of hospitals devoted to the reception of women about to be confined; here the conditions are constant, the affection to be treated is always the same.

The collection and comparative analysis of the statistics of such institutions has been brought to a condition of great perfection in Europe, especially in Germany, with the result of exciting a spirit of emulation among the authorities of the obstetrical hospitals as to which one of them shall possess the best record, and the wide publication of these reports has had, moreover, the very valuable effect of making it impossible that a hospital should have a conspicuously bad record without giving some explanation for it. Such a collection of statistics in regard to the lying-in hospitals of this country does not exist; to supply this deficiency, therefore, the writer has devoted considerable time and attention, with the result of obtaining the records of 19,902 confinements during the six years, 1880-1885, divided among 34 hospitals.

Of the importance of possessing such knowledge it is almost unnecessary to speak. By placing the statistics in a tabulated form, the records of those hospitals which are unusually good may be compared with those that are conspicuously bad, and if the divergence in results between them is great some explanation for this fact must be sought. Then, again, the total result, the average mortality, may be compared with the average hospital mortality in other countries, and, most important of all, it will be necessary to contrast the mortality of obstetrics in hospital practice with that of general practice, as on the result of this comparison should depend the very existence of these institutions; for it must be conceded that no hospital, whether supported by the community or by private charity, has the right to subject its inmates to a danger of death much greater than if they had remained in their own homes, no matter how squalid they might be.

The study of the following statistical table, therefore, will be divided under three heads: First, a study of the table itself, with a comparison of the individual records, and an explanation, if possible, of their wide divergence; second, a comparison of the average hospital mortality in this country with that of some other countries; and, third, a study of the relation that hospital mortality bears to the mortality of general practice.

Institution.	Total confinements, 1880-85.	Per cent. of	
		deaths.	deaths from sepsis.
Baltimore, Maternity	694	2.59	0.86
Boston, Lying-in Hospital	1599	3.81	3.10
New England, Moral Reform Society	191	0.00	0.00
Hospital for Women and Children	552	0.72	0.36
Brooklyn, St. Mary's Hospital	298	2.01	0.33
Maternity	552	1.63	1.44
King's County Hospital	834	2.63	1.19
Chicago, Women's and Children's Hospital	515	1.35	0.58
Women's Refuge	60	6.66	3.33
Cincinnati, St. Joseph's Lying-in Hospital	275	0.72	0.72
Cleveland, The Retreat	192	1.04	0.52
Detroit, Women's Hospital and Foundling's Home	295	4.74	3.05
Hartford Hospital	139	2.87	2.87
Indianapolis City Hospital	323	5.26	4.33
Louisville City Hospital	428	2.33	0.70
Minneapolis, Northwestern Hospital	45 ¹	4.44	2.22
Newark City Hospital	77 ²	3.89	2.59
New Orleans, Charity Hospital	808	5.32	2.97
New York, Blackwell's Island	2842	2.92	1.82
Nursery and Child's Hospital	1239	2.90	1.53
Infant Asylum	1057	1.79	0.85
Emigrant's Hospital, Ward's Island	871 ³	3.55	2.64
Foundling Asylum	847 ⁴	1.41	
Infirmary for Women and Children	613	0.48	0.16
Asylum for Lying-in Women	464	1.29	0.32
Philadelphia, Almshouse Hospital	1099 ⁵	4.34	
Maternity	503	1.39	0.79
Women's College Hospital	458	2.83	1.52
Lying-in Charity	174	0.57	0.57
Pittsburg, City Hospital (Almshouse)	206 ⁵	3.53	2.65
Rochester City Hospital	139	0.71	0.71
Monroe Co. Hospital	93	1.07	1.07
St. Louis, Lying-in Hospital	623	1.92	1.28
Washington, Columbia Hospital	797	1.25	0.50

Total number of women delivered 19,902
 " " " " died 516

It cannot be claimed that the preceding list is a complete one of all the lying-in hospitals in this country; there were some that ignored repeated requests for their statistics, there were others that refused to give them, and still others whose records when obtained were found valueless for the purposes of this paper. In addition to these hospitals una-

¹ 1882-85. ² 1882-85.
³ Records prior to 1881 unreliable.
⁴ Causes of death not given.
⁵ Only reckoned for last three years.

¹ Read before the Philadelphia Obstetrical Society, March 3, 1887.

voidably omitted from the list there may be others of whose existence the writer is unfortunately ignorant. It is improbable, however, that the addition of any records that have been omitted would seriously affect the final result. The number of cases dealt with is so large as to insure the approximate accuracy of the conclusions arrived at.

A death-rate of 2.59 per cent. of the women confined. It must be surprising to one who has not devoted much attention to the subject to find that, of the women of this country who perform the perfectly physiological function of childbearing in hospitals designed for their reception at such a time, 1 out of every 38 must die. One looks involuntarily to the table to learn if this represents the true state of affairs in all lying-in hospitals. If they all have a death-rate closely approximating this, then the only conclusion possible is that such a mortality is inseparable from childbirth in hospitals. A mere glance, however, suffices to show that the onus of producing a mortality as high as 2.59 per cent. of the women confined, rests not upon all, but conspicuously upon a few. Ten hospitals may be selected whose average mortality is 4.48 per cent. of the women confined; or, of every 22 women who are compelled to seek shelter in these institutions, 1 will die. On the other hand, ten hospitals may be selected, of which the average mortality is only 0.87 per cent., in which 115 women must be delivered before 1 dies. Can there be a satisfactory explanation for a divergence in results so wide as this?

It has often been asserted that unmarried primiparæ form the most unfavorable class of cases possible; that, in addition to the primiparity which is acknowledged everywhere as an unfavorable factor in obstetrics, the shame connected with the illegitimate birth exerts an almost murderous influence in raising the mortality among these women.¹

It might, therefore, be expected that only hospitals devoted to this class of cases would be found among those contributing to raise the general mortality, while in those where the mortality was so low there would be found a large proportion of multiparæ. Again, a reference to the table of statistics will show the truth or the fallacy of this surmise. We shall find that the record of the Maternity Hospital of Philadelphia, an institution devoted entirely to the care of unmarried primiparæ, will show a death-rate of 1.39 per cent., while the Boston Lying-in Hospital, in which more than half the patients are married women and presumably multiparæ, although the annual reports give no information on this point, has a mortality of 3.81 per cent.

It may also be claimed that a high mortality is inseparable from a lying-in hospital that deals with a large number of women yearly; but if this is the case, it must be due to over-crowding, which can occur just as well in a small as in a large hospital, but is unjustifiable in either. And, in fact, if we look again to the table, we shall find the highest mortality in a hospital which reports only 60 cases for the six years. It is useless to look further for a

satisfactory explanation for the high death-rate that prevails in many of our lying-in hospitals, for no good reason can be found, and the conviction is forced upon us that such excessive mortality is utterly unjustifiable. That this is true and that, even in institutions whose previous record had been simply shocking, an earnest effort toward improvement will accomplish much, is shown by the following table of the death-rate by years in two large hospitals.

DEATH-RATE PER CENT. OF WOMEN CONFINED.

Institution.	1880.	1881.	1882.	1883.	1884.	1885.
Boston. Lying-in Hospital	5.58	3.18	6.00	5.88	1.94	1.31
Philadelphia, Blockley Almshouse	6.01	4.08	3.92	7.31	3.19	1.52

The sudden decrease in the mortality of the Boston Lying-in Hospital, in 1884, was the result of a letter calling the attention of the managers to the really murderous death-rate of former years in that institution. The improvement begun in 1885 in the Philadelphia Almshouse still continues, the death-rate for the past year having been only 0.87 per cent. It is also gratifying to note the gradual improvement for the whole country shown in the following table:

Years.	Women confined.	Women died.	Death-rate per ct.
1880	2800	85	3.03
1881	3320	78	2.34
1882	3272	90	2.74
1883	3207	121	3.77
1884	3595	67	1.86
1885	3704	75	2.02

This improvement is not steady, but, as may be seen, the death-rate for the last two years is lower than for any two years previous.

To conclude the study and analysis of the table of statistics, it would be well to fix a maximum mortality for lying-in hospitals, beyond which none should go without giving a satisfactory explanation. We have seen that there are 10 hospitals on the list with an average mortality of only 0.87 per cent., and among these hospitals are some which deal with the worst class of cases imaginable. It would seem, therefore, reasonable and liberal to fix this limit at 1.5 per cent. of the women confined, and I am happy to say that in future the State Board of Charities in Pennsylvania will probably demand annual reports from the lying-in hospitals throughout the State, in order that if any one of them shows an excessive death-rate, that fact may be pointed out to the managers of the hospital with a request for an effort to secure better results.

Now we may pass to the second division of the subject and compare the records of lying-in hospitals in this country with those of some hospitals in the most highly civilized states of Europe.

It would be impossible, were it necessary or desir-

¹ Tait: Hospital Mortality.

able, to present a complete list of the lying-in hospitals, with their statistics, of the foremost countries of Europe. The brief little table that follows, however, will supply us with sufficient material to enable us to contrast the mortality of child-birth in hospitals here with the hospital mortality of some other countries.

	Period.	Delivered	Death-rate per cent.
Germany, 47 hospitals ¹ . . .	1874-83	104,328	1.37
England, 10 hospitals ² . . .	1870-75	18,369	1.05
Vienna, I. Geburts. u. Gyn. klinik des Allgemein. krankenhaus. ³ . . .	1880-85	15,070	0.70
Vienna, II. Geburts. u. Gyn. klinik des Allgemein. krankenhaus. ⁴ . . .	1882-85	8,355	0.52
Paris, Maternité ⁵	1876-82	1,223	0.49

We shall have little cause for congratulation if we compare the records of our lying-in hospitals with those of the 47 German hospitals collected and published by Professor Dohrn. These hospitals, although dealing with an immense number of women and making use of them, as a rule, for purposes of instruction, present a record twice as good as our own. The English hospitals, whose records are given by Tait, even ten years ago presented a very much better showing than ours do to-day; and when we see the really astonishing results achieved in the obstetrical clinic of the General Hospital in Vienna, where under one roof more women are delivered in a year than in all the hospitals of the United States, we have still greater reason for dissatisfaction with what we have done in this direction, especially as there can be no good reason why we should occupy such a disadvantageous position in this international comparison, for with our greater wealth and the superior physical and mental condition of our populace, as compared with the peasantry of Europe, we should in every lying-in hospital strive, at least, to equal the results obtained by Tarnier in 1884, when, in the Maternité, he had 1000 successive accouchements with but a single death.⁶

Finally, in order to determine the relation that hospital mortality bears to the mortality of general obstetrical practice, we are confronted by the necessity of fixing a normal death-rate after childbirth, of knowing how many women die during or after labor in a large city; for to make the comparison with hospital results a just one, we must have in both cases the same environment.

The almost insuperable difficulty of determining the exact mortality of obstetrical practice in a large community will be at once apparent. If we consult the city's official record of deaths, we may be sure

that many of those which are attributed to pyæmia and septicæmia really occurred during the puerperium, and that often a death directly connected with childbirth will, from ignorance, carelessness or design of the attendant, be ascribed to some other cause. The experience of the Registrar-General¹ of England in 1882 will be interesting in this connection. In that year there were reported, without further specification, 413 deaths from septicæmia and pyæmia, and 430 deaths from peritonitis, of women of childbearing age. A careful inquiry developed the fact that of the first group (413 deaths) 123 were due to childbirth, and that of the second group (430 deaths) 179 followed childbirth; in both groups of cases more than half the inquiries remained unanswered. This addition to the number of deaths after childbirth raised the mortality among the women who had been delivered in 1882 by 0.1 per cent., making the death-rate for the year throughout England 0.5 per cent. We may realize, therefore, how little reliance is to be placed upon official records if we would learn the true death-rate in obstetrical practice in a large city, where many of the women in labor fall into the hands of ignorant midwives or of physicians not much more skillful. I may as well at once assert my belief that this death-rate will closely approximate, if, indeed, it does not exceed, 1 per cent. of the women confined; but as there will be many, from the days of Le Fort to the present time, who will dispute the truth of this statement, it becomes necessary to support it by proofs that, to me at least, are convincing.

If we are unable to look for these proofs in our own official records, we have, nevertheless, several methods² at our command by which we may obtain the information desired. We might, as Tarnier once did, ascertain the number of women of childbearing age who had died in a certain district, and if by the record of births it was shown that any one of these women had given birth to a child within a month of her death, the death might be ascribed to childbirth. This method, if the record of births and deaths be reliable, can be depended upon to give a fairly accurate idea of the number of deaths from all causes after childbirth. We might, on the other hand, consult the records of other cities or countries which we have reason to believe more accurate than our own, or we may learn the results of the private practice of obstetricians who have attended a large number of women and have kept a careful record of their cases. Again, we might adopt McClintock's³ plan in order to obtain the number of deaths from all causes after childbirth, including those from non-puerperal causes, as such deaths must sometimes contribute to raise the mortality of hospitals. Collecting the results of the house practice of nine reliable physicians in 16,774 cases, McClintock found that more than a quarter of the deaths after childbirth were due to non-puerperal causes. If, therefore, 25 per cent. is added to the number of deaths appearing in a city's

¹ Dohrn: Zeitschr. f. Geburts. u. Gyn., B. xii. H. 1.

² Lawson Tait: Hospital Mortality.

³ Carl Braun: Beilage zu Nr. 35, der Wiener Mediz. Woch., 1886.

⁴ Ehrendorfer: Archiv f. Gyn., B. xxvii. H. 2.

⁵ Tarnier: Bulletin et Mémoires de la Société Médicale des Hôpitaux de Paris, 1882.

⁶ Annales de Gynécologie, 1884.

¹ Annual Report, 1883.

² Garrigues: Transact. of the American Gyn. Soc., 1877.

³ Dublin Quarterly Journal, 1869.

records as due to childbirth, a fair idea of the total mortality among puerperal women will be obtained.

Employing Tarnier's method, in Glasgow and Edinburgh, Duncan¹ found the mortality among women after childbirth to be 0.93 per cent. Applying McClintock's method to the records of Paris, St. Petersburg, and Dublin, he found the mortality in those cities to be respectively 0.83, 0.89 and 1.16 per cent. of women confined. By a careful analysis of the records preserved in the Health Department of New York City, Lusk² found that 1.17 per cent. of the women confined in New York, during the years 1868-75, died as a consequence of childbirth. In the Duchy of Baden there were delivered, in the year 1884, 54,996 women.³ Of these, 0.4 per cent. died of puerperal fever; 0.7 per cent. died after the performance of the different obstetrical operations, from accidents during labor, or from eclampsia; but the cause of death in some of these cases was undoubtedly septic poisoning, and they would consequently be included in the first percentage, so that the death-rate cannot be estimated by adding these two percentages together, which would make 1.1 per cent., but the death-rate is probably not less than 0.9 per cent. of the women confined, and this in an agricultural district containing no very large towns and with a comparatively healthy and prosperous population.

A. H. McClintock,⁴ speaking before the British Medical Society, gave the results achieved in private obstetrical practice by nine reputable physicians, men of no mean skill and intelligence, as the following list will show:

Campbell (Paris), of 1500 cases lost	13
Simpson	4
Matthews Duncan,	8
McClintock,	12
Thos. Hamilton,	7
Chas. Egan,	8
W. T. Greene,	12
George Jones,	16
Uvedale West,	23
	<hr/>
	10,818
	103

A death-rate of 0.95 per cent.

These figures certainly seem to justify the assertion that, at least, 1 per cent. of the women delivered in a large city will die. If one hesitates to admit that such is the mortality associated with what is usually regarded as a simple physiological process, what shall be said of the death-rate attending confinement in the lying-in hospitals of this country, which is more than twice as great as that of general practice, and in individual instances four and five-fold greater?

The title, charitable, can be conferred upon many of these institutions only by the followers of Malthus; but as their existence has become a necessity in all populous communities, a necessity which will become more pressing as the population of this country becomes more densely concentrated at certain points and the poverty of the lower classes increases, surely

common humanity demands that they be controlled by State or municipal supervision, in order that they may fulfil the ends for which they were intended—that they may truly afford aid to a woman at a time when it is most urgently needed—and that they may not, as many of them do to-day, make childbearing as dangerous to the woman as an attack of typhoid fever or the performance of laparotomy.

¹ Matthews Duncan: *Mortality of Childbed and Maternity Hospitals*. Edin., 1871.

² *The Science and Art of Midwifery*, p. 645. New York, 1886.

³ *Aerztliche Mittheilungen aus Baden*, Nr. 5, 1886.

⁴ *British Medical Journal*, Aug. 10, 1878.