

ON PUERPERAL FEVER IN RELATION TO
THE INFECTIOUS DISEASES NOTIFICATION ACT OF
1 8 8 9.

It cannot be denied that the Infectious Diseases Notification Act of 1889 has shown itself in many ways to be a useful measure. With regard to certain diseases at any rate, notably Small pox, Diphtheria, Enteric and Scarlet Fever it has done much to check the spread of epidemics. It has done much also to improve our knowledge of the usual channels of infection.

With regard to a few diseases - such as tetanus and anthrax, their rarity in ~~men~~ has probably alone prevented their inclusion in the schedule of compulsorily notifiable diseases. a/

One disease however, Puerperal Fever, stands alone with regard to notification. It is included among the compulsorily notifiable diseases, yet it has been alleged:

(1) That the mortality from this disease has not decreased since 1889 (1)

(2) That there are certain evident objections to its notification. (2)

(3) That its notification is very imperfectly carried out. (3)

In the following paper it will be my object to show:-

I. That the death rate in England and Wales from Puerperal Fever has shown a marked decrease since the introduction of the Infectious Diseases Notification Act of 1889.

II. That the Act, however, is not generally complied with at present, as regards Puerperal Fever.

III. That more complete notification of cases of Puerperal Fever would be conducive to a further diminution in the death rate from this disease.

1. Decrease in Mortality from Puerperal Fever.

In 1897 Dr. Cullingworth delivered an inaugural address before the Obstetrical Society of London, on "The Undiminished mortality from Puerperal Fever in England and Wales." (4)

In this lecture, arguing from the data that were then available, namely the Registrar General's reports down to 1895, he points out quite truly, that, even allowing for an increase that is more apparent

than real from 1881 onward, there was no appreciable decrease in the number of deaths certified as due to this cause. And a reference to the table which I give below will show that in 1895 the outlook was gloomy enough. 1893 had shown the relatively enormous death rate of 3.3 per 1000 births, the highest on record since 1874, and worse than that, the averages taken over longer periods, 5 years for instance, seemed to show but little diminution.

This very fact of the continued high death rate, from Puerperal Fever down to 1894 at any rate, brings into stronger relief the improvement that is shown in the figures that we can now consider, from that year down to 1899. And the reproach that compulsory notification of the disease had not been followed by any diminution in its ravages is now taken away - though we may not perhaps be able to go the length of proving that the improvement is due to this cause.

T A B L E I.

Death rate from Puerperal Fever 1871--1899

Year	No. of deaths	Deaths per 1000 births.	Year	No. of deaths.	Deaths per 1000 births.
1871	1464	1.8	1886	2078	2.3
1872	1400	1.7	1887	2450	2.8
1873	1740	2.1	1888	2386	2.7
1874	3108	3.6	1889	1852	2.1
1875	2504	2.9	1890	1956	2.2
1876	1746	2.0	1891	1973	2.2
1877	1444	1.6	1892	2356	2.6
1878	1415	1.6	1893	3023	3.3
1879	1464	1.7	1894	2167	2.4
1880	1659	1.9	1895	1849	2.0
1881	2287	2.6	1896	2053	2.2
1882	2564	2.9	1897	1836	2.0
1883	2616	2.9	1898	1707	1.8
1884	2468	2.7	1899	1008	1.1 (5)
1885	2420	2.7			

In the above table the increase in 1881 will at once be noticed. It is pretty certainly to be attributed to the practice of the Registrar General, begun in that year, of writing for fuller information to all medical men certifying deaths in women of

child-bearing age as due simply to Peritonitis Septicæmia or Pyæmia. This has led to the discovery of numerous deaths from Puerperal disease, and was followed by a rise in the average number of recorded deaths from 1·75 to 2·75 per 1000, as shown by the five years before and the five years after 1881.

Taking quinquennial averages throughout the period from 1871 to 1899 we get the following :

T A B L E II.

Deaths from Puerperal Fever per 1000 births from 1871 to 1899

1871 - 1875	2·52
1876 - 1880	1·76
1881 - 1885	2·76
1886 - 1890	2·42
1891 - 1895	2·50
6 1898 - 1899 (4 yrs.)	1·77
or 1895 - 1899	1·82

In looking at this table we must not forget that the Notification Act of 1889 was an adoptive act, and was at first very far from universally adopted by Sanitary Authorities. Further, it will be shown later on, that if it is ill complied with at

the present time, it was during the first few years so very much worse observed, as to be practically a dead letter. The slight increase in deaths during the first quinquennium after its enactment (1891-1895) must therefore not be placed to its discredit. As a matter of fact the high average in this period is due to the high death rate of 1893, a high death rate that was shared in by every other infectious disease, and which may have been due partly to exceptionally dry weather, and partly also to the number of constitutions ~~that~~/weakened by the great Influenza epidemic of 1892.

The fall in the last quinquennium is too marked and sustained to be regarded as an accidental and transitory phase. Some cause or causes - are at work which tend to diminish mortality from Puerperal Fever. Partly no doubt we are indebted to a more thorough education in, and more perfect observance of the rules of antiseptic and aseptic obstetrics. But this cause has long been at work, and it is difficult to avoid the belief that some credit at any rate is due to Notification for a substantial diminution in Puerperal mortality which represents the saving of the lives of about one thousand Mothers annually in England and Wales.

II. Is the Infectious Diseases Notification Act at present generally complied with in so far as it relates to Puerperal Fever?

Before we answer this question, a previous one presents itself to us. What is intended by the term Puerperal Fever in this Act? The framers of the act probably did not regard any definition as necessary, any more than in the case of Scarlet Fever or Small Pox. But the more one studies the subject, the more one is struck with the diversity of opinions as to the meaning of the term. The fact is, that Puerperal Fever is not a single, definite, specific disease - a "nausological entity" to adopt the cumbersome phrase that has been used, by some authors - but rather, as Liebmann has described it ⁽⁶⁾ a "complex of appearances which can be produced by different micro-organisms."

The "Nomenclature of Diseases" issued by the Royal College of Physicians of London discountenances the use of the words Puerperal Fever, and tells us that Puerperal Saproemia, Puerperal Septicoemia and Puerperal Pyoemia are the proper terms to apply to some of the conditions which used to bear the name - "Other conditions included under the term" are alluded to ⁽⁷⁾ but are not described.

Now no doubt this is a very desirable change in nomenclature, but it does not help us much. And indeed it is of little use to be told that we are to give up the term "Puerperal Fever" so long as the Act of Parliament does not give it up. And we are left at a loss both as to the nature of the "Other conditions included under the term", and as to whether all cases of Puerperal Saproemia, Septicæmia and Pyoemia should fall under the provisions of the enactment.

Being without any authoritative ruling on the subject, each practitioner is left to the light of his own intelligence and of his own conscience - both variable quantities - to say what cases he will and what cases he will not, subject to a possible penalty of £2. sterling, notify to the Medical Officer.

Since however, as I shall show later on, there are often strong reasons in the mind of the medical attendant in charge of a case for refraining from notifying its existence, it is not surprising that the most divergent views of what is necessary are taken. Most generally perhaps the severity of the symptoms is accepted as a criterion - a proceeding, the absurdity of which becomes evident if we apply the same rule, say, to Scarlet Fever.

Others however have brought forward views of a most comprehensive kind as to what is notifiable

under the term. Thus Dr. Thresh makes the following statement. (8)

febrile/
"Possibly the best plan is to consider all the peculiar ~~fabrill~~ conditions coming on 2 - 9 days after delivery as being Puerperal Fever, and to divide the cases into the following classes :-

- (1) The Aseptic or traumatic form
- (2) Form due to septic intoxication
- (3) Form due to septic infection ...
- (4) Puerperal Pyoemia -
- (5) The Zymotic form. Due to Erysipilas, Scarlet Fever, Measles or Typhoid Fever."

Now from a theoretical point of view this description is far too wide. Class 1. is not only obviously non-infectious, but belongs largely to the physiology and not the pathology of the Puerperium, while the majority of the diseases included under Class 5 are already notifiable under their proper names, and are not essentially altered although they may perhaps be modified by occurring in a puerpera. At the same time, from the practical point of view of the hygienist, it is better, where diagnosis is uncertain, to notify a case of aseptic ~~dramatic~~ fever *traumatic* than to omit to notify a septicoemia; and where for instance Tetanus is otherwise unnotifiable, it would obviously be advantageous if a case of this disease

in a Puerpera were reported to the sanitary authority so that proper precautions for isolation and disinfection might be taken - even if in theory we are unwilling to include it under the term "Puerperal Fever."

Let us first consider the matter from a theoretical standpoint. The researches of Vidal, Cornil, Clivio and Monti, Doty~~en~~, Cushing, Bumm, Döderlein and many others, have established this much.

1. That the characteristically severe and often fatal fever of childbed is due to wound infection by bacteria - most frequently by a streptococcus which is probably identical with the S. of Erysipelas and of spreading cellulitis (9) But also by others such as Staphylococci, B. Coli Communis (10)- and putrefying organisms.

2. That we may divide cases into those of true septic Infection, or Septicoemia, in which the organisms enter into and multiply in the blood and tissues of the patient; and those of septic Intoxication or Saproemia, where the organisms remain in the uterine cavity or genital passages, and symptoms are produced by the absorption of their ptomaines (11) But that the same organism may at one time produce a *sapraemia* and at another a *septi^eoemia* (12)

3. That as the general symptoms manifested by the patient, such as temperature, malaise,

weakness, collapse and death are caused in either case by the absorption of Ptomaines, and as a Laproemia 5 may give rise to the severest symptoms and even cause the death of the patient, we cannot expect to distinguish these two conditions clinically by the mere study of symptoms (13)

When we come however to consider which special forms of wound infection are to be included under our definition, we get into difficulties. Are we to include Tetanus, or Gonorrhoea - Or if their method of entry is proved to be by genital wound infection, Scarlet Fever or Diphtheria?

In a careful paper on this subject the answer given to such a question by Olshausen is an unqualified negative (14) His reason is, that the above diseases are so characteristic as to be easily recognisable even when occurring in the puerpersium and that as Tetanus or Gonorrhoea remain Tetanus or Gonorrhoea in a puerpera, it would be more confusion to call them Puerperal Fever.

But - remembering that we are still looking from a strictly theoretical standpoint - might not the same be said of the disease produced say by streptococci? No doubt it is often indistinguishable clinically from that produced by Staphylococci and other germs - but this may be simply because we are not yet expert enough clinicians to distinguish

them. The end of this century may see physicians diagnosing with ease between a "streptococcoemia" and a "stephylococcoemia" - and dividing the latter into an "aurea" and an "alba" variety. And conversely previous to the discovery of the diplococcus by Neisse~~s~~, the distinction between puerperal peritonitis due to gonococci, and that due to septic organisms was not an easy one to make out. The fact is that the term "Puerperal Fever" as used by Olshausen is simply a sort of refuse heap on which to put the infectious puerperal conditions that have not yet received special names. He himself recognises the fact fully, for he emphatically points out that the definition he suggests can only be regarded as provisional, and will be altered by the further progress of our knowledge.

Theoretically then, and from the point of view of exact science we may say that we can have nothing to do with Puerperal Fever. We will gladly strike it off our nomenclature of diseases, and murmur our thanks to the Royal College of Physicians for the permission to do so. But we are still confronted with the practical problem: What cases are we to notify under the act?

Now the answer to this question is not, after all, a difficult one, if we bear in mind that notification does not bind us to any Pathological theory.

The common sense point of view is that notice should be given of all infectious Puerperal disorders, and this point of view has, I am glad to say, the sanction of Mr. W. H. Power, Principal Medical Officer to the Local Government Board. In a letter to Dr. Griffith he writes as follows :-

"The object to be attained in so far as preventive medicine is concerned, is to bring to the knowledge of the Sanitary Authority all those conditions which, supervening upon parturition, are communicable from one puerperal woman to another." (15)

Of course it is needless to notify under this heading the cases that are notifiable by other names. Thus Scarlet Fever in a Puerpera may quite well be notified as Scarlet Fever - and if Septicoemia were notifiable apart from its occurrence in childbed, we might notify it under this name even when affecting a Parturient woman. Since it is not, we continue to notify only the Puerperal form of the disorder, and to notify it under the name which is recognised by law.

The practical question then is: Which puerperal conditions are infectious and dangerous to Parturient women. What are the cases after attending which a nurse should not be allowed to visit another Puerpera

without previous disinfection?

Putting the question in this form shows at once that the distinction between septicoemia and saproemia does not put the former out of account for our purpose. If streptococci can set up a saproemia, there is no reason to regard them as non-infectious on the occasions when they do so. They may undoubtedly be carried to another puerpera, who may be less fortunate, and entering into her tissues they set up a septicoemia.

There is a popular belief that a severe case of puerperal sepsis is more likely to be communicated to another patient than a slight one. Whatever amount of truth there may be in the belief is certain to be exaggerated; for it is generally the case that diseases breed true, and that a germ having somehow acquired a virulent character in one individual will retain its virulence when transplanted to another. And a series of cases of severe or fatal septicoemia attracts far more notice both from the public and the profession than a series of slight cases. But we cannot trust to this "breeding true" of slight cases. Any one who is familiar with scarlet fever is familiar with the fact that even in an epidemic of a mild type of that disease we are liable to meet with severe cases; and it is not an unknown phenomenon for such

a mild epidemic to change ~~the~~ character, and become
severe. This is eminently likely to occur in the
case of puerperal sepsis, for we must remember that
the puerpera offers an exceptionally favourable ground
for the culture of germs - and it is now one of the
commonplaces of bacteriology that the virulence of
germs, and particularly of streptococci depends not so
much on specific difference as on culture (16)

~~What then are we to say of Gonorrhoea, and of
Tetanus? (-) Muir & Ritchie Manual of Bacteriology
pp 155 - 156. Truly they are to be regarded as~~
falling under our working definition.

It is an extremely difficult thing to diagnose
gonorrhoea from septic \neq peritonitis - the criterion
given by some authors that the latter is fatal and the
former is not would hardly be of practical use for
our purpose, even if it were accurate. Moreover
we may have a case of mixed infection in which a
single bacteriological examination might yet give us
gonococci in pure culture. And apart from these
considerations, it is certainly undesirable and danger-
ous to have a nurse from a case of gonorrhoeal peri-
tonitis attending other puerperal without proper
precautions. In short, there is no doubt that the
disease is one which can be conveyed, though less
easily than streptococcal infection. As to Tetanus,

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its infectious character is beyond question

What surgeon would complacently allow a case of this disease to be nursed in a general surgical ward? The spores of this bacillus are peculiarly resistant, and though they do not apparently often develop so as to produce the disease, yet we do not know enough of the conditions under which they may do so to allow them to be carried about to susceptible patients. When Tetanus has been made a notifiable disease (as it should be) we may cease to notify cases of it as Puerperal Fever. Till then, it is our obvious duty to do so.

To the inclusion of Saproemia cases in a definition of Puerperal Fever for the purposes of notification, Bumm (17) objects strongly, on the ground that they are so numerous that isolation would be impossible - "Only the forms of childbed fever, he says, that are due to infectious organisms (streptococci, vibriion Septique, etc.) are readily conveyed ~~conveyed~~, and the putrefactive germs do not cling like the infective ones. If we are to keep midwives from contact with putrefactive germs we must forbid them to nurse puerperoe, as the lachial discharge even of patients without feverish symptoms often, if not usually, contain these same germs whose presence in the uterine cavity causes absorption fever." In

short he would have bacteriological investigation of every feverish case carried out - and notification depend on the result.

To this I would answer, first, that the precautions to be enforced by a judicious medical officer would not be such as would make their wide application impracticable as they would probably consist simply in disinfection of clothing, bedding and room - a process carried out by the S.A. - in forbidding attendance of the nurse simultaneously on any other puerpera - and in disinfection of her clothing and person at the termination of the case.

In the second place we have not yet arrived at such a level in culture as to make bacteriological diagnosis possible in every case - or in one case in a thousand. Most medical men have not the necessary technical skill and this will probably remain more or less true for the next 20 or 30 years. If they had, our patients are not, at present at least, prepared to allow the amount of manipulation necessary for the carrying out of such researches as Bumm suggests.

Until we can arrive with more certainty at a diagnosis between the more and the less infectious forms of puerperal fever, we must for the purposes of the Act abide by the definition suggested by Olshausen: (18)

"We must call Puerperal Fever those cases of sickness of Parturient women which are caused by septic organisms, including those anaerobes which normally exist in the genital passages, equally whether an Infection in the strict sense of the word, or only an Intoxication is produced by them" - But to this we must add, (~~) Q.B. f C. 1899 No. 1 p. 5.~~ cases of sickness produced even by "specific" organisms (such as the gonococcus or B. tetani) so long as the specific form of infection produced by them is not otherwise notifiable under the act.

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Having then determined what should be understood by the term "Puerperal Fever" we are in a position to criticise its notification as at present carried out.

With this object I have made a study of some of the figures available. Unfortunately no general statistics are to be had. In the annual reports of the Local Government Board however, the returns of certain Urban districts whose Medical Officers furnish weekly reports to the Board, are published in summary. The collective population of these districts in 1892 (the first year of publication of such statistics) amounted to 13 millions, and in 1899 reached about $15\frac{1}{2}$ millions. We may take it therefore that the figures given represent fairly the state of matters in the Urban districts throughout the country.

No general returns of the Rural districts are to be had, and unfortunately few of the County Medical officers publish summaries of notifications of infectious diseases. Such statistics for one county are to be found however in Dr. Thresh's "Summary of the Reports of the District Medical Officers of Health in the Administrative County of Essex" which is issued annually. For our present purpose returns from small districts are more instructive than those from larger ones, so that the county reports furnish much useful information.

Non notification of fatal cases.

On looking through the returns published it is startling to find definite proof that a considerable proportion of fatal cases are not notified.

This fact is of course only discoverable in the instances where it also happens that the total number of deaths is in excess of the total number of notifications. If however, in any district one or two unnotified cases happen to end fatally, while an equal or larger number of notified cases survive, no proof of the non-notification of the former will be shown by the statistics.

Taking first the figures in the Local Government Board report for 1892 we find the following returns amongst others.

T A B L E I I I .

District.	Notifications.	Deaths.
Hornsey	8	10
Davenport	4	8
Gloucester	2	3
Smethwick	1	2
Wigan	9	16
Oldham	9	21
Dewsbury	0	3
Barnsley	2	3
Darlington	5	9
Swansea	0	5
Totals.	40	80

We thus see that in 10 towns we have definite proof that of 80 cases actually diagnosed as puerperal fever twice as many ended fatally as were notified. We say "at least" as we have no proof that all the 40 notifications referred to fatal cases. The pro-

bability is that some of them did not; and in that case the number of un-notified fatal cases would be still larger.

As I have pointed out, these 40 cases are brought to light by the mere accident of there not being a large enough number of non fatal-cases notified in these particular districts to hide them.

In the year in question (1892) the returns given by the Board refer to 117 Urban districts, in which these were in all 1075 notifications of Puerperal fever and 789 deaths. The figures given above (Table III) refer to 80, or one tenth of those deaths. If a like proportion of the remaining 709 deaths were those of un-notified cases - the total for the year would be 394 un-notified fatal cases.

Had even these fatal cases been notified, the notifications for the year would have amounted to 1469; and the ratio of deaths to cases would have been 789 to 1469 or 53.7 per cent in place of 789 to 1075, or 73.4 per cent.

Such a calculation as this cannot of course pretend to the mathematical accuracy that its form would suggest. The assumption that in all districts the proportion of un-notified fatal cases to deaths would be the same as in the districts where these cases show themselves is quite unwarrantable. Where only one tenth of the cases in a series is known we cannot estimate the probable values in the other nine tenths with any reasonable degree of accuracy. Still the calculation is worth making, as it shows in a striking manner how large is the known discrepancy between our figures and fact.

In this ~~report~~ we may note however, that a great improvement has taken place since 1892 - The figures given in the Annual Reports (Appendix L) are as follows :-

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Year.	Deaths of Unnotified cases.	Total Deaths.	Percentage of Deaths of unnotified cases to Total Deaths.
1892.	40 out of 80	789	5.1
1893	54 " 95	960	5.7
1894	20 " 43	647	3.1
1895	21 " 38	598	3.5
1896	12 " 20	728	1.6
1897	4 " 13	660	0.6
1898	5 " 19	629	0.8
1899	6 " 13	705	0.9

This improvement is due no doubt partly to greater familiarity with the act on the part of practitioners and partly to the remonstrances of Medical Officers of Health. Still that even so large a proportion as practically 1% of fatal cases should fail to be notified, is a far from satisfactory state of affairs

Passing now to the figures for the Administrative County of Essex, we find a ~~steady~~ neglect of notification. The total figures are but small, and the total number of deaths of unnotified cases is never large - indeed in three years, only one such case is to be found - But on the other hand, there is only one year in which no such case shows itself, and last year as many as 3 out of a total of 29 deaths for the county, fell under this category.

similar

T A B L E V.

Administrative County of Essex.

Year.	Total deaths from Puerperal Fever.	Deaths of unnotified cases of Puerperal Fever.	Percentage of Deaths of Unnoti- fied cases to total Deaths.
1891	23.	7	30
1892	30	6	20
1893	42	2	5
1894	16	1	6
1895	12	3	25
1896	17	1	6
1897	21	0	0
1898	17	1	6
1899	29	3	10

Had these failures to notify fatal cases been confined to one or two districts, this list would have but little significance, except to show that in these particular districts there were medical men who did not notify. But while they recur in one or two places, they are on the whole pretty impartially distributed over the county - Thus while 5 are found to the credit (or discredit) of Billericay 3 each in London and Winstree, and in East Ham, and 2 each in Maldon (Rural) and ~~in~~ ⁱⁿ Tendring, the remaining 9 are distributed over as many districts.

*Lexden
in Tendring*

The percentages of deaths of unnotified cases to total deaths from this cause, are well above the percentages shown by the figures in the Local Government

Board reports. This fact tends to confirm our suspicions that the latter figures are too low, owing to the masking of non-notified fatal cases by the notification of others which did not prove fatal in the larger districts dealt with.

But with exact figures and percentages we have here nothing to do. Enough has been said to show that even among fatal cases, notification, if less neglected than it was ten years ago, is still very imperfectly carried out.

Notification of Non-fatal Cases.

With regard to non-fatal cases, such a statistical enquiry as the above is of course not possible - But it is easy to believe that for every patient that is allowed to die without her case being notified, when the medical attendant is aware of the nature of her illness, or he would not return the cause of death as "puerperal fever" - and where in consequence he must know that he runs some risk of a prosecution under the notification act - there must be many who suffer from Puerperal Septis, recognised as such, and who survive, whose cases never come to the knowledge of the Sanitary Authority. What their number is we can only wonder.

But besides the cases recognised as puerperal fever by the bulk of the profession, there is a large number of puerperal who suffer from septis of a localized character or from sepremia. In my opinion there are few medical men who notify such cases. That they are numerous, no one who has had to carry on a practice among the working classes with untrained nurses of th/ old school will deny. Even under better conditions they are not rare. *Bumm* out of

1072 births in 1898 records 167 of feverish symptoms of which ~~we~~ attributed 56 to septic absorption - This gives practically 5% of all confinements. Fortunately however they are not very fatal. Probably 1 or 2 per cent would be an over estimate for the total death rate of cases showing distinct evidence of sepsis in the puerperium - Let us compare this with the most general statistics available, those furnished by the Local Government Board reports to which we have already alluded. Though they refer, as we have said, to only a part of the population, they are for this purpose none the less valuable.

T A B L E VI.

Puerperal Fever in certain districts of England & Wales.

Year.	Notifications.	Deaths.	Percentage of deaths to notification.
1892	1075	789	73.4
1893	1384	960	60.7
1894	1065	647	60.8
1895	985	598	60.7
1896	1326	728	54.9
1897	1193	660	55.3
1898	1212	629	51.9
1899	1303	705	54.1

If our estimate of the mortality from puerperal sepsis is correct, these figures show what a small proportion of all the cases is ever notified, even if we discount the first four years in the table, on the ground that at that time medical men had perhaps

not yet learned to follow out the provisions of the act. (x)

The general conclusion that may be drawn is that the Infectious Diseases Notification Act is, so far as it concerns puerperal fever is very far from being generally complied with at present, even as regards the severer and fatal cases of Puerperal infection, and much more as regards those slight cases of Septic mischief, which we have yet recognised as legitimately falling under the provisions of the Act.

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Hoping to obtain some further light on this subject I communicated with Mr Monod, Conseiller d'Etat, Directeur de l'assistance et de l'Hygiene Publiques in France - By his kind courtesy I obtained the figures for notification and death in Paris. The Notification act in France was passed in 1892, and it could not be said to come into working order till 1895. Since then the figures have been (in Paris only).

	NOTIFICATIONS	DEATHS	DEATHS p.c. of NOTIFICATIONS
1895	183	157	85.8
1896	218	188	86.2
1897	209	146	69.8
1898	192	126	65.6

It may be some satisfaction to the true Jingo patriot to see that the medical profession in France is even more backward than our own in complying with the law - unless indeed they have a severer type of the disease to deal with, or are less expert in its treatment - neither of which alternatives is very probable.

The question at once arises, why this neglect of duty on the part of medical practitioners? What are the objections to the notification of ~~p. f.~~ which give rise to such wholesale evasion of the law?

puerperal fever

Objections to the Notification of Puerperal Fever, and their validity. It is worth while noticing one curious objection to the notification of Puerperal Fever which though it has no weight in this country, is considered grave enough in France to have provided an exception to the application of the law - That is, the possibility of notification entailing a violation of professional secrecy on the subject of pregnancy - Concealment of pregnancy in this country is a crime. In France it is a virtue, and according to the "Nomenclature des Maladies epidémiques" given by the "Loi du 30 November 1892" "~~Infectio~~s puerp~~rales~~" are only to be notified "lorsque le secret au ~~fu~~get de la grossesse n'aura pas été réclamé."

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The objections to the ~~modification~~ of Puerperal Fever in this country may be summarized, according to Berry Hart (19) as follows:

notification

"(1) The difficulty of defining what one means by Puerperal Fever.

(2) The risk of statistics being misleading

from errors unavoidable or otherwise, in diagnosis

(3) The supposed unwillingness of practitioners to notify, unless in cases likely to end fatally."

(1) With the first of these objections I have already attempted to deal. And if the broad view of the act suggested above were generally received it need occasion no difficulty.

(2) Were the compilation of statistics in the interests of theoretical epidemiology the only object of notification, it might be urged on the ground of the second objection that the act was useless. Though even then, it is to be said that erroneous statistics, where the source of error is more or less constant, are better than none. Indeed a personal error of observation is inherent in every observational science, and varies only in amount.

But the main object of the act is practical: the shielding of puerpera~~x~~ from infection. If puerperal sepsis is infectious, and is liable to be spread by nurses, by clothing and so forth, and if it is possible by appropriate means of disinfection to check this spread, then the notification of even a proportion of the cases of this disorder is a solid gain, and not to be d~~y~~s-

pised. Where notification of a disease involves removal of the case to an isolation Hospital, an error of diagnosis may lead to the infection of a patient not really suffering from the disease in question. But in the case of Puerperal Fever this objection ~~case~~ ^{can} have no weight, as no doubtful case of this disorder at any rate would ever be removed.

Moreover the diagnosis of Puerperal sepsis presents no greater difficulty than that of Enteric fever, for instance. In both illnesses some cases are quite easily recognised. In both some cases may tax the diagnostic skill of an expert to the utmost.

(3) Coming now to the supposed unwillingness of Practitioners to notify, we reach, I believe, the true difficulty.

According to Berry Hart:

"No medical man in charge of obstetric cases but will find it disagreeable to notify puerperal septi-cemia as compared with zymotic cases those of puerperal septi-cemia place on the practitioner's shoulders the onus in certain instances of actually causing the condition." He however adds "That the cases are notified conscientiously I have no doubt as in looking over the statistics of large towns & like Sheffield, London and Leeds, one is struck with the fact that the notified cases exceed the actual deaths by a considerable number."

With the first of these statements I am in complete agreement. From the latter I must entirely dissent. The fact of the notifications in the larger towns exceeding the deaths by a "considerable number" which is adduced as a proof of conscientious notification, only affords such a proof if the proportion of deaths to notifications is not higher than we have a right to expect from our knowledge of the nature of the disease. As I have pointed out this is not the case in this instance, unless we

found our definition of Puerperal Fever upon the death rate, and not vice versa.

As a matter of fact if the reading of statistics given above (pp. 19-23) is a correct one, there is a failure to notify many even of the cases which prove fatal. While if our view of what is really notifiable can be sustained, the law would appear to be practically a dead letter.

In the discussion which followed Dr. Berry Hart's paper at the Ipswich Congress (20) the danger to a Practitioner's reputation incurred by notification was repeatedly insisted upon - by Drs. Campbell, Macan, Brummitt, Helme and Griffith. This seemed indeed to be the only objection urged. And there is no doubt, human nature being what it is, that if the public have the idea that the medical attendant is wholly responsible for sepsis in cases under his care, the duty of notification will be apt to be evaded. Few men are bold enough to write themselves down criminals or incompetent in their patients' estimation if they can avoid it. And there can be little doubt that this view of the case is one that

is widely and increasingly held by the laity.

In such a view there is no doubt a partial truth but only a partial truth after all.

In many cases the responsibility lies chiefly with the medical man. Where he is able to arrange every detail of the circumstances of the confinement including the choice of a nurse, of a healthy lying-in room and of a proper accouchment outfit, the margin for contingencies beyond what is theoretically under his control is small. It may indeed be limited to the meagre possibilities of "autoinfection" How small this margin is, may be seen from the splendid statistics of our lying-in hospitals.

Unfortunately even in cases where he has a free hand, the practitioner is sometimes himself the source of danger. I must reluctantly say that I believe that a large number of medical men do not take antiseptics seriously in obstetric work. So far as my experience goes, in lying-in hospitals a confinement is rightly regarded in the same light as a serious surgical operation, and precautions are taken accordingly. But on the other hand there are many hundreds of practitioners at large in this

country who would not even venture on an abdominal operation, being only too well aware of the inefficiency of their antiseptic methods, who yet will light heartedly apply forceps or introduce the hand into the uterus for version or the removal of a placenta. The forceps are boiled perhaps - at home - and carried loose in the obstetric bag, or wrapped in chamois leather to preserve the plating, to the patient's house. But ~~after~~ they are allowed to remain in the bag for a week or two after boiling before they are used. In most cases no harm results. Is it surprising that sometimes Providence is less kind? What bacteriologist would regard an instrument after such treatment as sterile for laboratory purposes, even if it happened to be immersed for a few seconds in a creoline bath before use, or was smeared with vaseline that had once contained some carbolic? And if the cleanliness of instruments receives little attention, that of the vulva generally receives less. It is so easy to trust to a chapter of accidents and to hope that the patient will escape with, at the worst, a little sepsis of the lochia.

often

Puerperal sepsis may and often does follow on such slip shod methods as I have described - not from my imagination, but from what I have seen over and over again. And the public would not be wrong in such cases if they laid the blame at the door of the medical man.

On the other hand accidents will happen, quite apart from what may be called criminal negligence. Even in the calm and seclusion of the laboratory cultures sometimes "go wrong" without gross carelessness on the part of the bacteriologist. Somehow, a slip is made, we can hardly tell how or when. It is obvious that such slips are more liable to occur, are infinitely harder to guard against, in the complexity of circumstances attendant on a confinement. So that while, as I have said, theoretically matters may be under the control of the medical attendant, they would be completely so only if he were an infallible and impeccable machine. As Napoleon once said, the best General is the man who makes fewest mistakes. We may say that the most

aseptic surgion or accoucheur is only the least
septic.

It would be well if the public could be taught
to understand this - could be made to realize that
after all has been done that human care, and the
training of a human being can do, there yet remains
a certain risk - a small one no doubt - but a
real one.

To put the matter shortly, we have among the causes of Puerperal sepsis

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1. Negligence of proper antiseptic precautions on the part of the medical attendant.

2. Similar negligence on the part of the nurse.

3. A certain residuum of liability to error dependant on the whole character, habits and training of the doctor and of the nurse. The smallness of this residuum is what is meant by the term "professional skill" in this respect - It may be reduced almost to a vanishing point - but that it still exists, probably the most skilful surgeon or obstetrician would be the last to deny.

4. What we may term "sanitary" causes - such as undiscovered defective drains - and, in general, septic germs in air or water, on the floors or walls of rooms - in bedding &c. These may be quite beyond the control of the medical attendant.

5. Pre-existing causes in the patient herself, auto-infection from germs already in the vagina, urethra, bladder, tubes, or possibly in remoter parts of the body.

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The public have learned to recognise the first of these causes, and perhaps the second. It would be foolish as well as wicked to attempt to teach

them that it does not exist. They must however be educated by the profession to recognise the existence of the other causes as well.

When this lesson has been learned, no conscientious practitioner need fear for his reputation in telling his patient's friends the real nature of her illness. If he has already gained their confidence he will not thereby forfeit it, as they will feel assured that the first of the above causes is not in question, and that though the third is a possibility, it is one that could not be escaped by a change of doctor.

The reluctance of practitioners to notify is a genuine difficulty in the carrying out of the act. It is a difficulty which one is reluctant to admit, yet in the face of facts one must admit. It is a difficulty which it is the duty of Sanitary Authorities to combat, if necessary, even by the prosecution of those who persistently refuse to comply with what they know to be their legal duty.

III. More complete notification of cases of Puerperal Septis would conduce to the further diminution of the disease.

I have already attempted to show by statistics that the death rate from "Puerperal Fever" has

shown some diminution since the time when the Notification ~~act~~ may be said to have got into some kind of working order - But even if we have established the fact that this diminution followed closely on the introduction of the act, we must not allow ourselves to be entrapped into the fatally easy reasoning - post hoc ergo propter hoc.

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It is necessary in order to come to a conclusion as to the utility, actual or probable, of notification, to consider -

1. Whether notification, and the possible action of the Sanitary Authority in consequence, can check the spread of the disease -

2. Whether there are any respects in which such measures are and must be unless -

As to the first point, very little need be said. It is granted by everybody, and has been known for long enough, that Puerperal Sepsis is an infectious condition, easily conveyed by a third person from one Puerpera to another, and the contagion of which is apt to remain for a long period in rooms, or clothes or bedding. This being so, it is obvious that if Sanitary Authorities will take the trouble to take efficient action on the notification of a case - one cause of fresh cases

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will be prevented.

With regard to the second point however we must not expect too much from notification and isolation, as there are other causes of puerperal sepsis besides antecedent cases of the disorder.

With Puerperal Fever a specific disease like Small Pox, caused solely by an organism which could not well exist except in the puerperal human body, notification along with isolation and disinfection might serve to stamp it out completely - Unfortunately this is not the case. As we know, there is no such specific germ. The most perfect precautions to prevent infection from other puerperal would not eliminate the risk of streptococci being conveyed from suppurating wounds; or of a fever set up by the staphylococci which lodge on all our hands daily, or which may be born in the air from a neighbouring rubbish heap - Nor must we forget that some authorities would have us believe that certain recognised specific diseases may in a Puerpera give rise to septic fever. The most notable suspect in this respect is Scarlet Fever and it is not without interest to try to ascertain whether the notification returns can in any way serve to confirm or discredit such a suspicion.

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In his learned text book of obstetrics, Dr Barnes makes the following statements: (21)

"It is sometimes said that Scarlet Fever in a Puerpera is Scarlet Fever, and nothing more . . .

There is something more, and that is the Puerperal constitution. This supplies a special culture ground, which modifies the Scarlatinal poison, and this in such a manner as to disguise or ~~mask~~ it." 5

Also "If we can prevent Scarlet Fever only, we shall have diminished the number of Puerperal Fever cases by at least one half."

There is nothing a priori impossible about this view of the matter. It seems certain that the various forms of streptococci are not specifically distinct - and if the *S. conglomeratus* were shown conclusively to be the cause or the invariable accompaniment of Scarlet fever, it would not be difficult to believe in its modification into the *S. pyogenes* in the soil of a puerpera.

On the other hand, septicemic rashes are apt to mislead the unwary as to the true nature of the disease - a mixed infection is always a possibility - and further I cannot recall any instance of a case of scarlet fever being traced back to infection from a simple case of puerperal sepsis. 5

The following sensible view of the subject is propounded by Goodall and Washburn: (22) "The virus of Scarlet fever 'breeds true', whether it attacks individuals in perfect health, or women in the pregnant or puerperal state. Nevertheless many cases of Scarlet fever are complicated with septic troubles, such as sloughing of the fauces, and even pyoemia; and cases complicated by affections of this nature may give rise to puerperal septicoemia should proper antiseptic precautions not be carried out. . . . There is no strong evidence to show that pregnant or puerperal women are more or less liable to contract scarlet fever than are other women, nor that when attacked they are more severely affected."

Further, in his exhaustive paper on the subject of Puerperal mortality, Dr. Williams states that he has been unable to ~~turn~~ any cases to scarlatinal infection, and having observed several confinements in scarlet fever houses, he records: (23)

1. That the majority of cases confined in Scarlet Fever houses escaped entirely.
2. That occasionally the mother takes Scarlet Fever, but does not develop any Puerperal symptoms, such as rigors, high temperature, abdominal tenderness, foetid lochia etc, and generally recovers.

There seems then to be strong evidence against the scarlatinal origin of septic Puerperal disease. Let us consider what indications, if any, for or against such a view, are to be gathered from statistics -

With this object I have prepared the following tables (VII - XII) and graphs, showing the incidence of the four principal zymotic diseases and of Puerperal Fever, compared to the population of the districts selected - The figures are taken from Appendix L of the annual reports of the Local Government Board, from 1892, the first year of the publication of this Appendix; to the last published, that for 1899.

Notifications and not deaths have been selected since epidemics vary in their case mortality within such wide limits, that the death rate from a disease is by no means a safe guide as to its prevalence.

The first of these tables (Table VII) gives the combined notifications in all the districts whose returns are published by the Local Government Board - As the number of these districts is added to yearly, this gives a constantly increasing population. To eliminate the preponderating influence of the London district Table VIII has been added,

which refers to all the areas in Table VII with the exclusion of London - The other tables given, refer to London, and the three principal towns in England.

Now in considering these tables we must bear in mind what may be the meaning of a simultaneous variation in the prevalence of any two diseases - Obviously it may be due:-

1. To pure coincidence - This becomes increasingly improbable the longer the series of observations dealt with. In the series we have before us it is practically nil.

2. To a common cause for increase or decrease in the two diseases - such as meteorological, sanitary or economic conditions -

3. To a relation of the two diseases in which one stands as cause to the other - such as for instance the increase of respiratory diseases which is caused by an epidemic of influenza. Thus if Scarlet Fever were the cause of half the cases of Puerperal Fever, as asserted by Barnes, we would find in any given locality a tendency to coincidence of epidemics of these two disorders.

Now in dealing with a comparatively rare disease like Puerperal Fever, when the number of

cases notified amounts on an average to less than 1 per 10000 persons living, statistics are of little value when derived from a small community, as a single case will affect our returns to the extent of 10 p.c. in a community of 100000 - The only towns that give large enough returns to be of such value are our great cities.

On the other hand we would expect, if the relation of Scarlet to Puerperal Fever is that which has been suggested, to find the evidence of this fact more clearly in comparatively small communities such as Liverpool, Manchester or Birmingham than in London - since epidemics are more marked in the former than in the latter, where they do not readily spread over the whole community.

If on the other hand both these diseases are governed by some generalized cause, such as meteorological conditions, we may expect to find a greater similarity in their variations the larger the area considered, as merely local variations will tend to neutralize and mask each other.

And this is precisely the tendency that is shown by the tables and diagrams below.

In Diagram I a remarkable similarity is shown between the curves of Scarlet and Puerperal Fever, and of Erysipelas. And the epidemic of 1893 which

is the most marked feature in each of these, coincides with a similar epidemic both of Enteric fever and of Diphtheria.

In Diagram II the 1893 epidemics of all the five diseases is again well marked, and a smaller one of all except Enteric fever also shows itself. Here again Scarlet fever, Puerperal fever and Erysipelas resemble each other in quite a striking manner.

In Diagram III again, we see that in London all the epidemic diseases except Enteric follow a similar course - 1893 and 1896 being both bad years, while 1898 is in every case the lowest on record, or in the case of Puerperal fever, nearly so.

In the remaining three diagrams however, which relate to Manchester, Liverpool and Birmingham, quite a different appearance is shown. In neither of these can any similarity be traced between the curves of Scarlet Fever and of Puerperal Fever - Indeed in Manchester they vary almost inversely - And the cross purposes at which the curves of the other diseases run is no less striking. Only in the case of Erysipelas and Scarlet Fever in Liverpool can one see any similarity.

We may conclude then

1. That Scarlet Fever is not shown to be an important factor in the etiology of Puerperal Fever, as asserted by Barnes.

2. That the incidence of Puerperal Fever, like that of all the other zymotic diseases, is influenced by some general causes, meteorological or other, whose effects are only to be seen in widely taken statistics where local variations are eliminated. These causes, whatever they are, seem at the same time to be favourable to the life conditions of the germs of the other principal infectious diseases, or it may be, unfavourable to the conditions of health and the powers of resistance of their human hosts.

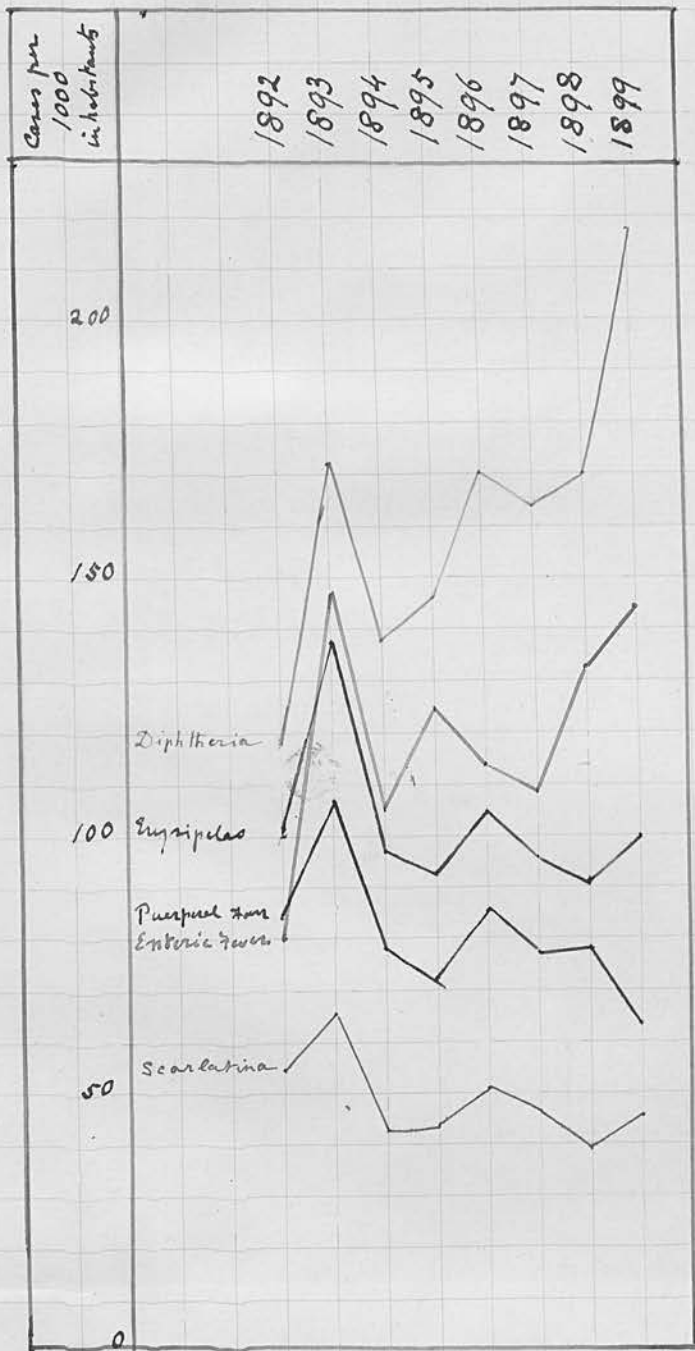
To recapitulate: There are many causes of Puerperal Fever apart from antecedent cases of the disease, even though we cannot reckon Scarlet Fever among these causes. On the other hand conveyance of infection from one patient to another especially by midwives and unskilled nurses is a fruitful source of the complaint. To this means of spread we have a preventive in the shape of notification if our Medical Officers and Sanitary Authorities are not content to let the matter stop short, once

the case is notified. But no action by Sanitary Authorities will serve to completely stamp out the disease unless we have at the same time more carefulness about asepsis on the part of medical men, and until the untrained and uneducated midwife is as extinct as the dodo.

Diagram I.

Infectious Notification Curves.

General.

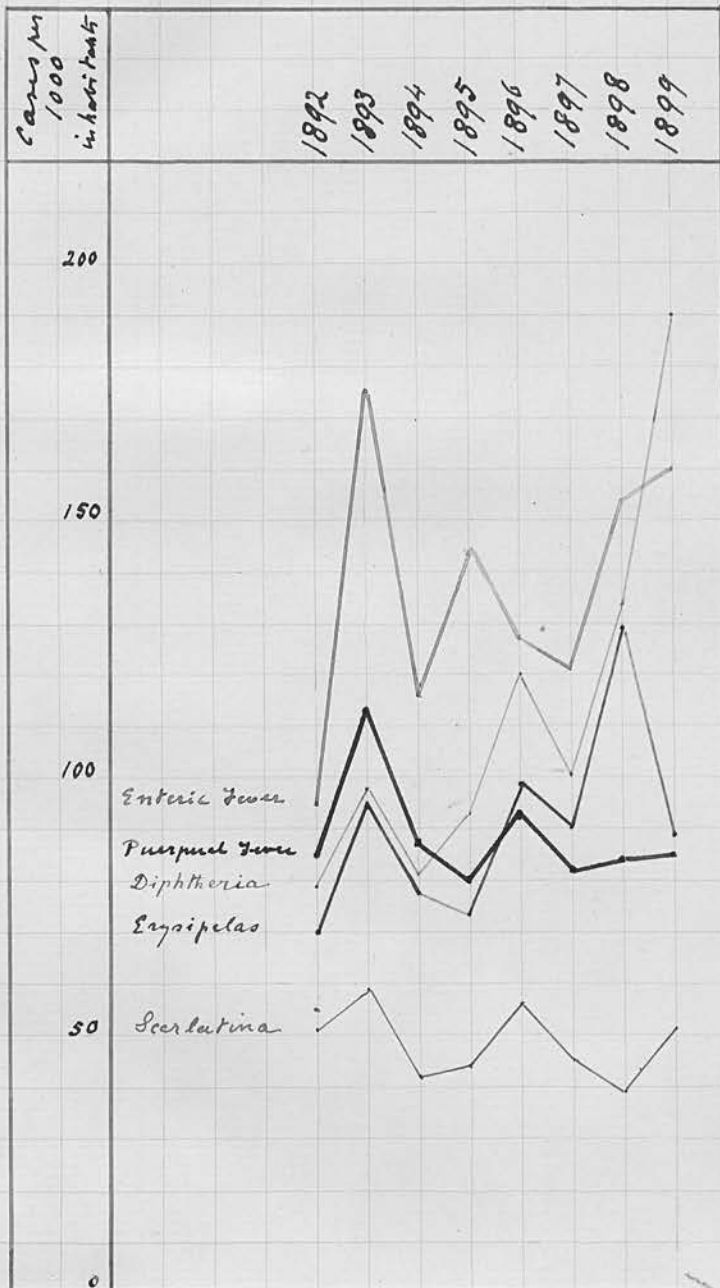


Note. For convenience of comparison of their variations different scales have been adopted for the different diseases. In the first column the figures are to be regarded as so many per 10,000 for Scarletina, & per 1,000,000 for Purpura fever.

Diagram II

Infectious Notification Curves

General without London.



Note: Scarletina per 10,000.

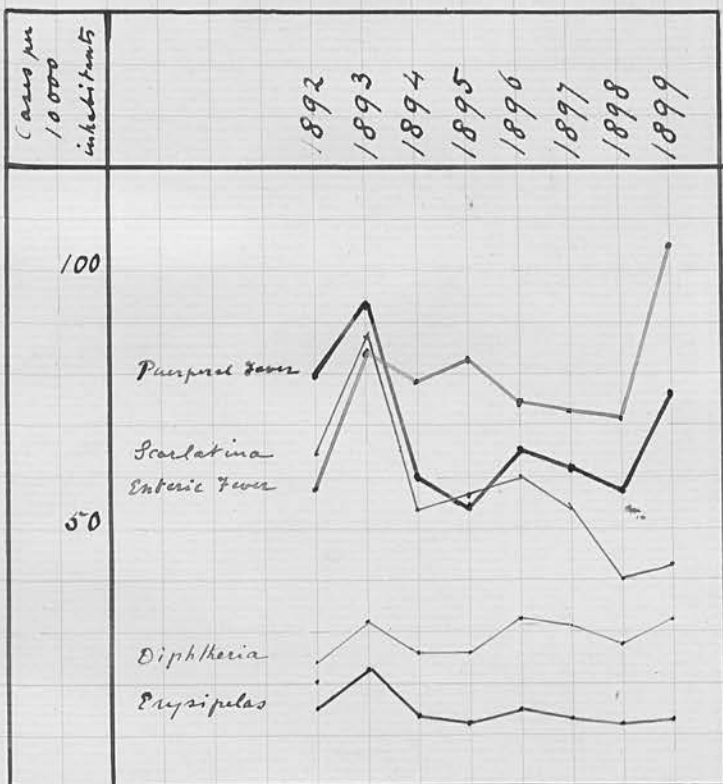
Purpural fever per 1,000,000

Other diseases per 1,00,000

Diagram III

Infectious Notification Curves.

London.

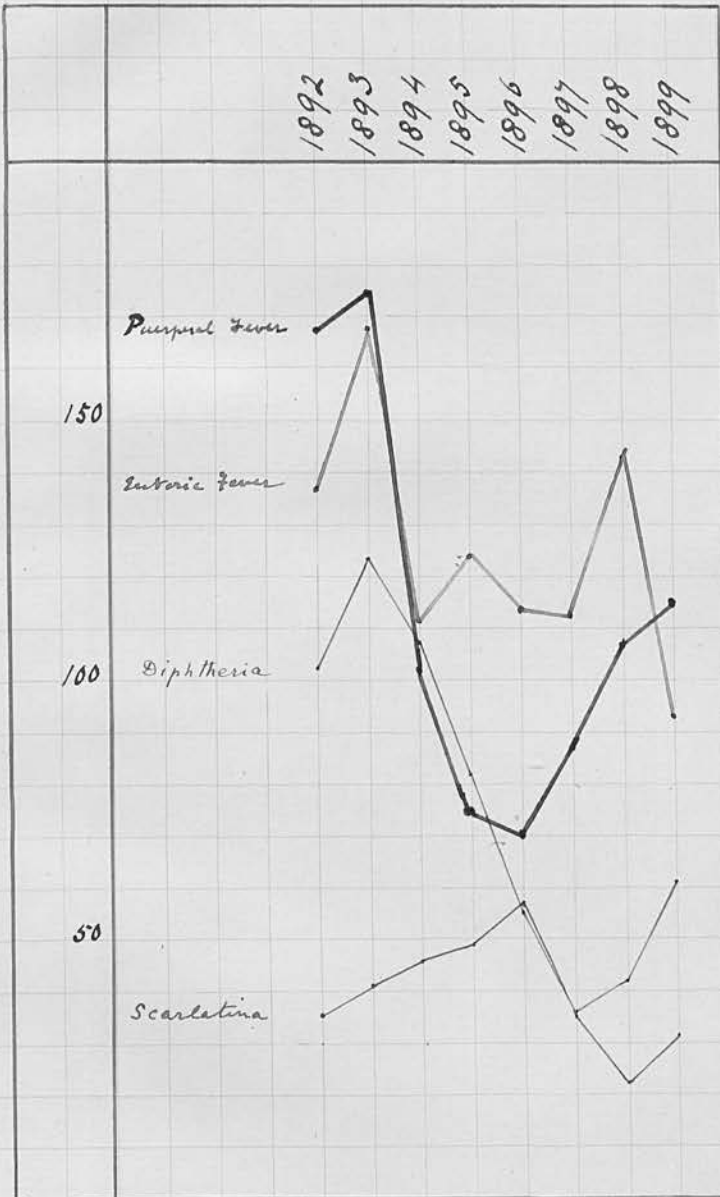


Note. Enteric fever, per 100,000
 Purpural fever, per 1,000,000
 Other diseases, per 10,000

Diagram IV

Infections Notification Curves.

Manchester & Salford.

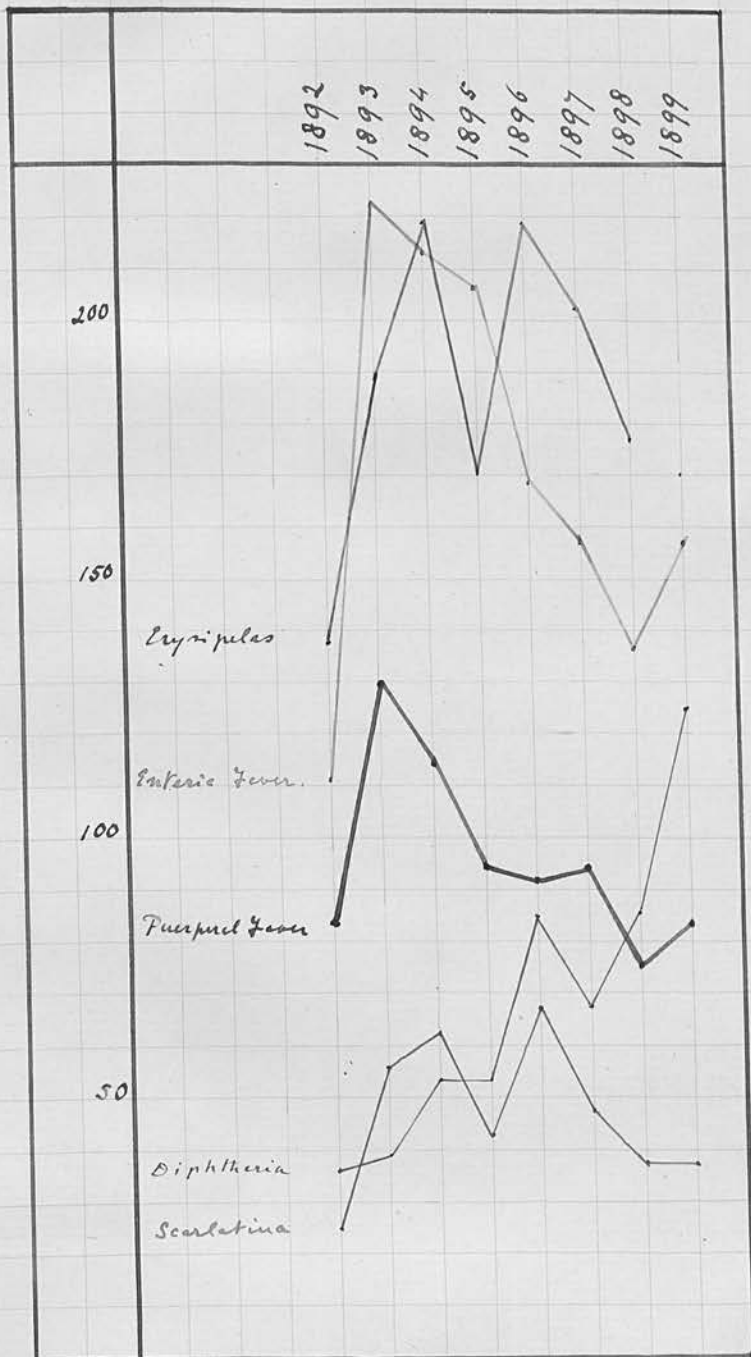


Note: Enteric fever & Diphtheria per 100000
 Scarletina per 10000
 Purpural fever per 1000000.
 Erysipelas is not notifiable.

Diagram V

Infection Notification Curves

Liverpool.

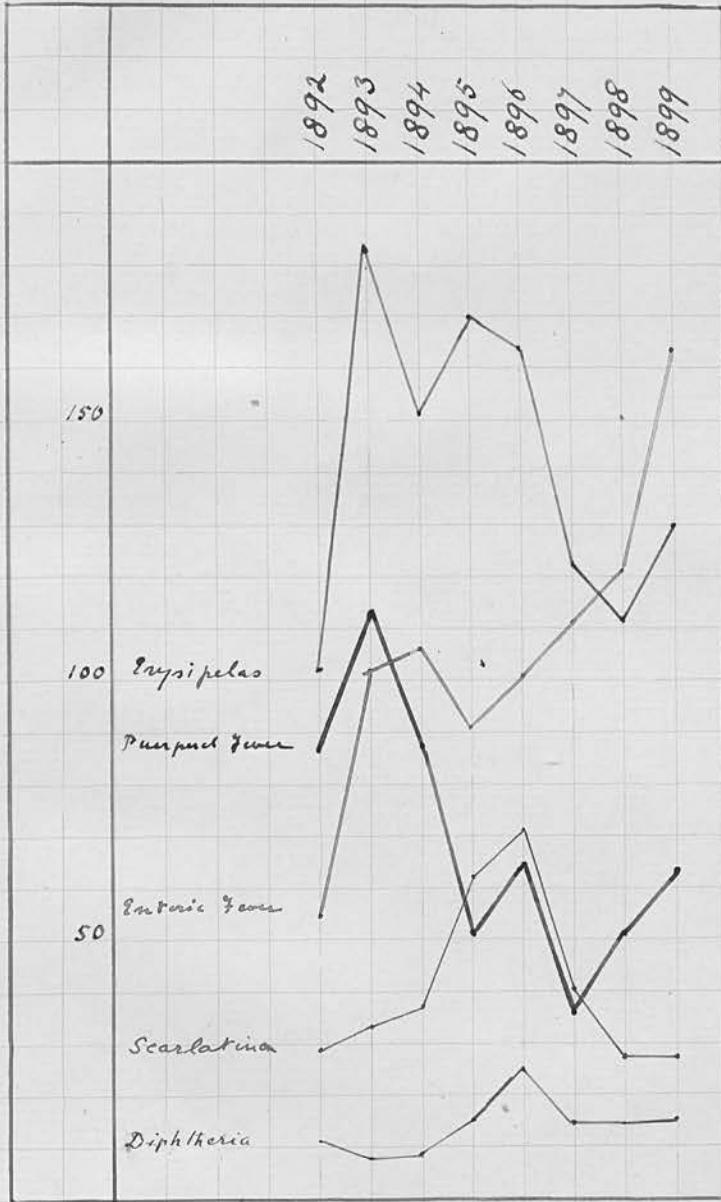


note: Scarletina per 10 000
 Purpural Fever per 1 000 000
 Other diseases per 100 000

Diagram VI

Infectious Notification Curves -

Birmingham.



Note: Erysipelas & Enteric Fever per 1000.0
 Scarletina & Diphtheria per 100.0
 Purpura Fever per 100000.0

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T A B L E VII.
NOTIFICATIONS - GENERAL

Year	Population	Scarlatina		Diphtheria		Erysipelas		Enteric A		Puerperal Fever	
		Number of Cases	Cases per 100,00 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living
1892	12852060	70611	55.0	22927	11.8	12964	10.0	10685	8.0	1075	0.84
1893	12913846	88373	66.7	22148	17.2	17918	13.8	18833	14.6	1384	1.07
1894	13603101	58127	42.7	18837	13.8	13403	9.8	14394	10.6	1065	0.78
1895	13603101	60961	44.1	19963	14.6	12631	9.3	16911	12.5	985	0.72
1896	15446680	88713	50.9	26863	17.0	16463	10.5	17616	11.4	1326	0.85
1897	15549769	73421	47.3	25443	16.4	14975	9.6	16832	^{10.9} 10.9	1193	0.77
1898	15601102	60962	39.0	27133	17.0	14270	9.1	20607	13.2	1212	0.78
1899	15696600	75662	46.3	36261	21.8	15633	10.0	22855	14.5	1303	0.63
Average			49		16.2		10.3		11.9		0.80

T A B L E VIII.

NOTIFICATIONS - GENERAL without London.

Year	Population	Scarlatina		Diphtheria		Erysipelas		Enterica		Puerperal Fever.	
		Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living
1892	8619942	43516	50.5	6800	7.9	6030	7.0	8220	9.5	738	0.85
1893	8681728	51472	59.1	8454	9.8	8218	9.5	15170	17.5	987	1.13
1894	9370983	39687	42.3	7647	8.1	7323	7.8	11034	11.7	812	0.87
1895	9370983	41204	44.3	8740	9.3	6971	7.4	13405	14.3	749	0.80
1896	11214562	63066	56.1	13055	12.0	11180	9.9	14426	12.8	1049	0.93
1897	11317651	50571	45.8	11635	10.0	11036	9.0	13726	12.1	929	0.82
1898	11389359	44068	39.2	15276	13.4	15438	13.0	17583	15.4	955	0.84
1899	11484857	57573	51.1	22577	19.0	10027	8.9	18402	16	1303	0.85
Average			48.6		11.2		9.1		13.7		0.88

T A B L E IX.
NOTIFICATIONS - LONDON.

Year	Population	Scarlatina		Diphtheria		Erysipelas		Enterica		Puerperal Fever	
		Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living
1892	4232118.	27095	64.	8346	20.4	6934	16.4	2465	5.8	337	0.80
1893	Do.	36901	87.2	13694	32.4	9700	22.9	3663	8.6	397	0.94
1894	Do.	18440	43.6	11190	26.4	6080	14.4	3360	7.9	253	0.60
1895	Do.	19757	46.7	11223	26.5	5660	13.4	3506	8.3	236	0.56
1896	Do.	25647	60.6	13808	32.6	6436	15.2	6190	7.5	277	0.66
1897	Do.	22850	54.0	13192	31.2	5796	13.7	3106	7.3	264	0.62
1898	4211743	16894	40.0	11857	28.	5169	12.2	3024	7.1	247	0.58
1899	Do.	18089	42.9	13684	32.3	5606	13.2	4453	10.5	326	0.77
Average			54.9		29.0		16.4		7.9		0.63

T A B L E X.
NOTIFICATIONS - MANCHESTER & SALFORD.

Year	Population	Scarlatina		Diphtheria		Erysipelas		Enterica		Puerperal Fever	
		Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living
1892	703479	2532	36.0	729	10.3			971	13.8	118	1.68
1893	Do.	2896	41.0	883	12.4			1182	16.8	123	1.75
1894	Do.	3268	46.4	766	10.8			783	11.1	72	1.02
1895	Do.	3463	49.0	588	8.2	Not Notifiable	Not Notifiable	877	12.4	52	0.75
1896	703507	3968	56.4	397	5.6			804	11.4	49	0.70
1897	Do.	2504	35.6	253	3.6			794	11.3	62	0.88
1898	Do.	1556	22.0	293	4.2			1009	14.3	75	1.07
1899	Do.	2190	31.1	422	6.1			654	9.3	61	1.15
Average			39.7		7.6				12.8		1.17

T A B L E X I.
 NOTIFICATIONS - L I V E R P O O L .

Year	Population	Scarlatina		Diphtheria		Erysipelas		Enterica		Puerperal Fever	
		Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	Cases per 10,000 Living	Number of Cases	cases per 10,000 Living	Number of cases	Cases per 10,000 Living
1892	629443	1554	25.4	227	3.6	867	13.8	699	11.1	53	0.84
1893	629443	3538	56.8	250	3.9	1195	18.9	1396	22.2	82	1.30
1894	629443	3963	63.2	337	5.4	1382	21.9	1349	21.4	72	1.14
1895	629443	2710	43.2	340	5.4	1071	17.0	1306	20.7	61	.95
1896	629443	3584	57.1	533	8.5	1379	21.9	1063	16.9	59	.92
1897	630967	3001	48.3	430	6.8	1270	20.2	991	15.7	60	.95
1898	629548	2424	38.1	554	8.6	1113	17.7	863	13.7	48	.84 ⁷⁶
1899	629548	2416	38.0	793	12.5	1070	17	988	15.7	53	.84
Average			46.3		6.8		18.6		17.2		0.98