Special report on the supply of diphtheria antitoxin into the borough / by the Medical Officer of Health.

County Borough of Stockport.

SPECIAL REPORT

ON THE

SUPPLY OF

Diphtheria Antitoxin

IN THE BOROUGH,

BY THE

MEDICAL OFFICER OF HEALTH.

STOCKPORT:

NEW CHESHIRE COUNTY NEWS CO., LTD., PRINTERS, WELLINGTON STREET.

DIPHTHERIA AND ANTITOXIN SUPPLY.

The Medical Officer of Health submitted the following special report hereon :—

" In accordance with the suggestion thrown out by Councillor Smeeth to " this committee I have the honour to now report upon the question of the " supply of diphtheria antitoxin in the Borough. Diphtheria (under which " heading one invariably includes cases notified either as diphtheria or as " membranous croup) is a disease from which this town is practically never " free, as may be seen from the following figures :—

	Diphtheria.	Membranous croup.	Diphtheria and membranous croup.
" 1897	13	6	19
" 1898	12	3	15
" 1899	7	5	12
" 1900	20	7	27
" 1901	20	10	30
" 1902	25	4	29

" The extent to which the disease prevails in the town cannot be said to be " a serious one, but one has always to face the possibility that at some time " or other the illness may assume an epidemic character and invade a far " greater number of houses than the average. There is always the possibility " that any single case may, if proper precautions are not observed, become " the centre of a widespread epidemic. Each case, therefore, of diphtheria, " like each case of every other infectious disease, has to be dealt with, not " for what it is in itself, but for what its possibilities are as regards the " neighbourhood and the community at large. It is with this in mind that I " wish to ask your committee's favourable consideration of the suggestions " which I have now the pleasure of laying before you.

" Diphtheria is a disease which consists in the growth of a certain bacillus " on the throat or in the windpipe of the patient, this bacillus during its " growth and development leading to two things in particular : (1) the " formation of a dirty greyish-white false membrane or false skin which by " extending downwards into the air passages blocks them up and leads to " death by suffocation ; (2) the formation by the bacillus during its growth of " virulent poison or toxin derived from the body-material and body-juices, " which toxin circulates in the blood throughout the whole of the system and " gives rise to secondary diseases of the nervous system (leading to paralysis " of certain nerves and certain groups of nerves), of the kidneys, of the heart, " etc., an acute form of Bright's disease of the kidneys, to weakness and " sometimes paralysis of the heart itself, and to other serious and frequently " fatal complications. The presence of the poison or toxin in the blood of " the patient leads, although somewhat slowly, to the formation of a natural " antidote by the blood and by certain other constituents of the human " system. The extent to which this antidote is formed by the human system " itself depends of course upon the vitality of that system. If the toxin or " poison produced by the diphtheria bacillus be large in amount or specially " potent in character the system may not be able to produce a sufficiently " strong antidote, or sufficient of it, to counteract the effects of the toxin. So " long as the toxin remains in the system and is not counteracted so long " does the disease persist, and so long, of course, does there remain a chance " of a fatal termination or of serious complications setting in. By a series of " the most careful and exact experiments scientists have now been able " to produce an artificial antitoxin or antidote. This antidote is termed " diphtheria antitoxin or anti-diphtheritic serum. When injected into the " human system in cases of diphtheria it has precisely the same effect as the " antitoxin formed in the human system itself, that is to say, it acts as an " antidote and counteracts the effects of the toxin produced by the growth of " the diphtheria bacillus. In the case of weakly patients who are suffering " from a virulent attack of diphtheria, the injection of this artificial anti- " toxin is of inestimable benefit. Instead of waiting for the system itself to " slowly manufacture its own antidote to the poison which is circulating in " it, science has now provided that antidote ready made, and in a state such " that it will immediately, or almost immediately, counteract the bad effects " of the toxin. Diphtheria antitoxin has now been used in many thousands " of cases, and the reports as to its use from every quarter in which it has " been employed are in the highest degree favourable. The one single fact " alone that in many places the mortality from diphtheria has been reduced " from 28 or 30 per cent. down to 13 or 15 per cent. (a reduction of 50 per " cent.) is sufficient evidence to warrant its universal employment. It is not

" only employed in practically every single fever hospital in the world, but " it is extensively used in private practice, and in all cases with the best re- " sults.

" Not only has this artificial antitoxin a pronounced curative property, but " when injected in smaller doses into persons who are, or have been, in " contact with the infection of the disease, it acts as a preventive or prophy- " lactic, and in the majority of cases prevents the infection spreading " amongst persons thus treated. I would therefore suggest that whilst " mainly supplying the serum for curative purposes your committee should ' ask the co-operation of medical men in securing the preventive treatment " or, as it is termed, the immunisation of persons who have been in contact ' with the infection, for by this means the spread of the disease may be " very largely controlled. By securing the prompt curative treatment of " diphtheria cases by means of antitoxin-injection your committee will be " effecting a double purpose, that is to say you will be conferring a benefit " not merely upon the individual, but also upon the community. For, in the ' first place, the patient will be restored to health much more rapidly than ' if left to nature herself, and a fatal issue will be prevented in about 50 per " cent. of the cases. And, in the second place, by enabling physicians to " cure the disease at a quicker rate, and by preventing a fatal issue, your " committee will be getting rid of the source of infection more rapidly, and " will therefore indirectly be preventing the chances of the infection " spreading.

" Among municipalities supplying it free of charge to their inhabitants " may be mentioned Manchester, Liverpool, Blackpool, Bury, Burslem, " Newcastle-under-Lyme, Royston, Ilkley, Crewe, Stoke-on-Trent, Coventry, " Leicester, etc. I am indebted to the Medical Officers of Health of these " various towns for information relating to its municipal use, and partly from " the information thus supplied and partly from my own experience in the " use of the substance I am led to make the following recommendation :—

" That diphtheria antitoxin be supplied free of charge to medical prac- " titioners practising in the Borough for use in cases of diphtheritic disease " in patients resident in the Borough both for purposes of immunisation and " cure under the conditions now laid down, and that the Medical Officer of " Health be authorised to obtain for this purpose and from time to time " maintain an adequate supply of serum together with the requisite syringes " for the use of the same.

" In the conditions which I have deemed it advisable to lay down for the " free supply of antitoxin there is one in particular to which I should like to " draw attention, viz., that the serum be not supplied after the sixth day of " illness unless under the most exceptional circumstances and at the discre- " tion of your Medical Officer of Health. It has been found that in propor- " tion as the administration of antitoxin is delayed so does the mortality from " the cases increase. Taking, for example, the experience of the State of " Massachusetts, the fatality of those treated during the first two days of " illness was only 6·6 per cent., whereas the fatality of those in which the " serum treatment was delayed until the sixth day or later was nearly " three times as great, or 17·8 per cent. Further than this, the longer the " infected system is left without artificial antitoxin the more toxin comes to " be accumulated in the system, and therefore the larger must be the dose of " the antitoxin administered, and the smaller is the chance of it conferring " any benefit on the patient. To put it in another manner, a case treated " with antitoxin within the first two or three days will only require a small " dose of the antitoxin (costing from 5s. to 6s. or 8s.), and the chances of " that small amount of antitoxin doing good will be very great. On the " other hand a case in which the treatment with antitoxin is delayed until " the sixth day or later will require a large amount of antitoxin (costing from " 15s. to 25s.), and the chances of that treatment doing good will only be " very small. In the conditions attached to the use of antitoxin I have " therefore laid it down that the serum will not be supplied except it can be " used within the first six days.

" Probable cost: I have obtained from three different firms their prices " for the supply of diphtheria antitoxin, and the figures run as follows for " quantities of 2,000 units :—

" Messrs. Parke, Davis, and Co., 2s. 8½d.

" Messrs. Burroughs, Wellcome, and Co., 2s.

" The Jenner Institute of Preventive Medicine, 2s. 6d.

" In spite of the slightly increased price my experience leads me to " recommend the serum made by Messrs. Parke, Davis, and Co.

" In addition to the supply of serum it would be necessary to keep at least " two antitoxin syringes for the injection of the material ; these would cost " about 15s. each. The total cost of the whole would therefore not impose " any serious burden on the department.

" The following are the conditions which I suggest should be attached to " the gratuitous supply of serum :—

" 1. The serum will be supplied for hypodermic injection for either curative or immunising purposes, and medical practitioners will be expected to " use their best endeavours to secure the injection of prophylactic or " immunising doses in those exposed to infection.

" 2. The serum will only be supplied for use during the first six days of " the disease and not afterwards.

" 3. In each instance in which it is used medical practitioners will be expected to take a swab for bacteriological examination as early as possible " in the case (though not necessarily before the serum is injected), and a " further swab at or near the completion of the illness with a view to ascertaining the termination and the duration of infectivity of the case.

" 4. Medical practitioners will be requested to make a return on a printed " form to be supplied, showing the amount of serum employed, result of " illness, etc., together with any remarks likely to be of interest or practical " utility to the Health Department. Information supplied in this manner " will be regarded as confidential.

" 5. The syringe must be most carefully sterilised before and after use, and " the attention of the Medical Officer of Health must be drawn to any defect " at the time it is discovered or at the time the syringe is returned, so that " it may be at once remedied and the instrument always maintained in a " state fit for use in emergency.

" 6. The Sanitary Committee do not desire to restrict the use of antitoxin " for immunising purposes in any way whatever, but where it is used solely " for curative purposes they would earnestly ask all medical men to restrict " its free use under the present arrangement to those cases where the patient " is unable to pay for a private supply.

" 7. That the antidiphtheritic serum is supplied on the distinct understanding that this committee accepts no responsibility or liability whatever " for any ill-effects attributable (rightly or wrongly) to its administration."

(Signed) MEREDITH YOUNG,
M.D., D.P.H., D.S.Sc.,
Medical Officer of Health.

May, 1903.