APPENDIX A.

THE CONTROL OF DIPHTHERIA IN A RURAL HEALTH DISTRICT.

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The history of diphtheria in South Auckland Health District has been one of recurring outbreaks alternating with periods of low incidence. The records held locally go back to 1926. In the period 1926–39 there occurred 1,329 cases of diphtheria, with 39 deaths. In spite of modern treatment, the disease has still been dangerous, for about 3 in each 100 children contracting the infection have died. In 1936 an examination of the records for the previous decade showed undue diphtheria incidence 1929–33, followed by low levels in the next three years. It was decided to prevent further waves of incidence, if possible, by commencing an immunization campaign in 1937 while the trough of low incidence still held.

During 1937–38 mass immunization of school-children was effected. Altogether 10,034 children were dealt with through the schools, approximately 53 per cent. of the school population being immunized with anatoxin, receiving three doses of $\frac{1}{2}$ c.c., 1 c.c., 1 c.c. at intervals of three weeks. As far as the school population was concerned, the result was satisfactory for immunizing purposes. Only 783 pre-school children attended for immunization, a little over 5 per cent of the pre-school age population of the district. It is generally held that for safety in a preventive campaign against diphtheria about 50 per cent. to 70 per cent. of school, and about 30 per cent. of pre-school children need to be immunized. The local campaign was therefore about 20 per cent. low in protection of toddlers and pre-school children.

During 1939 the mass campaign being over, immunization was continued as a routine measure in each school medically examined. The School Medical Officer offered immunization at each school inspected, to all new entrants, to any pre-school children offering, and also to any older pupils who missed protection at the big campaign and now desired it. All acceptors are immunized with three doses of anatoxin after a preliminary Moloney test. In practice over the year this meant three weeks of school medical inspection followed by two weeks of immunization, thus keeping the two activities running co-incidently as a routine. A further 998 children were protected during the year, mainly new entrants, with a rising proportion of pre-school children.

The results to the present time are most encouraging. The work began to tell in 1938. Several small outbreaks occurred in areas where schools had been done, but, in except one instance, the cases occurred in the group who refused immunization. The exception was a boy of six years who attended for the first dose only. The district diphtheria rate fell to equal the lowest level for the fourteen years recorded here. In 1939 the brunt of diphtheria again fell on the uninoculated. One school, supposed to have been included in the campaign, suffered an outbreak of several cases. A check-up revealed the unexpected and unfortunate fact that, though planned for inclusion, the school had been missed. Surrounding schools protected in the campaign were unaffected. The omission was made good, and after immunization no more cases occurred. Another school urgently requested immunization for an outbreak limited to those refusing inoculation in the mass campaign.

Among the inoculated, 3 cases of proven diphtheria occurred. One of these was said to have been immunized against diphtheria in 1936 in Queensland, but as parents get inoculations mixed there is an element of doubt in this case. A second case had reduced doses only, because of susceptibility to anatoxin. The third had the full three injections. A fourth child, who had had two injections, was notified as a case, but proved to be an ear carrier only with no diphtheria clinically. Three cases are therefore returned as diphtheria in the inoculated. In the uninoculated, 32 proven cases occurred, 31 in children, only 4 of these being pre-school children. The number of pre-school children in the district being unknown accurately, a differential rate is struck for school-children only. The case rate per 1,000 school-children in the district for 1939 was 0·29 in the inoculated against 1·80 in the uninoculated.

The district incidence for the year shows a further fall in the rate per 10,000 population to 2·53, the trend being shown in the following table:—

1936	64 cases of diphtheria	.. 4·78 per 10,000 of population.
1937	88 cases of diphtheria	.. 6·47 per 10,000 of population.
1938	57 cases of diphtheria	.. 4·19 per 10,000 of population.
1939	35 cases of diphtheria	.. 2·53 per 10,000 of population.

One hopes that the present low rate will continue and even further improve; while no conclusions are drawn as yet, the above facts are encouraging, justifying continuance of artificial immunity work throughout the district.