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THE VALUE OF PREVENTIVE INOCULATION AGAINST CHOLERA.

SOME FIGURES FROM BURMA.

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A SEVERE epidemic of cholera broke out in the Meiktila district of Burma during the year 1928. Its special interest lies in the fact that a very large proportion of the inhabitants of the infected villages were inoculated, and secondly in the fact that careful records were kept.

The epidemic began in the latter half of May and was over by about the middle of November.

The disease originated in the Mahlaing Township of the district and spread thence to all the other townships and to the municipal town of Meiktila. In the district there occurred 992 attacks and 30 in the town. The rural figures are the more interesting of the two and are of much greater importance statistically than the town figures.

The total population of Meiktila district at the last census was 281,029. In this population there were 992 attacks, giving an attack rate of 3.53, and 744 deaths, giving a death rate of 2.65.

Out of this total population, 50,096 persons were inoculated against cholera during the course of the epidemic, by single doses of one c.c. of cholera vaccine obtained from Kasauli. The 230,933 remaining persons in the district were not inoculated. The comparative figures of attacks and deaths among the non-inoculated and the inoculated persons are shown in Tables 1 and 2 below:—

TABLE I.

Non-inoculated population in the district, 230,933	
Cholera attacks in above, 954.	Attack rate, 4.13
Cholera deaths in above, 706.	Death rate, 3.06

TABLE II.

Inoculated population in the district .. 50,096	
Cholera attacks in above, 38.	Attack rate, 0.76
Cholera deaths in above, 38.	Death rate, 0.76

It will be observed that the attack rate among the non-inoculated population in the district is 5.43 times greater than the attack rate among the inoculated population, while the death rate among the non-inoculated is 4.03 times that among the inoculated.

Out of a total of 1,030 villages in the district of Meiktila, 152 were infected during the epidemic, containing a population of 55,011 persons out of a total population of 281,029 contained in the district. This therefore was the population exposed to infection and among whom infection did actually occur, and it is interesting therefore to note in detail the statistics of the attacks and deaths among this population, comparing the figures for the non-inoculated with those for the inoculated.

Among this population of 55,011, there were 992 attacks of cholera, giving an attack rate of 18.03 and 744 deaths, giving a death rate of 13.52.

Of the 55,011 persons living in the infected villages, considerably more than half, namely 32,450, were inoculated, being a percentage of 58.99. Tables 3 and 4 below give the attacks and deaths with their rates among the non-inoculated population and among the inoculated:—

TABLE III.

Infected villages.

Non-inoculated population ..	22,561
Cholera attacks in above 954.	Attack rate, 42.29
Cholera deaths in above, 706.	Death rate, 31.29

TABLE IV.

Infected villages.

Inoculated population ..	32,450
Cholera attacks in above 38.	Attack rate, 1.17
Cholera deaths in above 38.	Death rate, 1.17

It will be observed that the attack rate in the non-inoculated population of the infected villages is 36.15 times greater than the attack rate in the inoculated population of these villages. It will also be noted that the death rate among the non-inoculated population is 26.74 greater than that among the inoculated.

The fact that the ratio of the attack rate among the non-inoculated to that among the inoculated is greater than the corresponding ratio of deaths is due to the circumstance that out of 38 attacks which occurred among the inoculated population of the infected villages all proved fatal. This point is illustrated in Tables V and VI which show the percentage of deaths to attacks of 74 among the non-inoculated compared with 100 per cent. among the inoculated.

TABLE V.

Infected villages.

Non-inoculated population ..	22,561
Cholera attacks in above ..	954
Cholera deaths in above ..	706
Percentage of deaths to attacks ..	74.00

TABLE VI.

Infected villages.

Inoculated population	..	..	32,450
Cholera attacks in above	..	..	38
Cholera deaths in above	..	..	38
Percentage of deaths to attacks	..	..	100.00

Both in the case of the non-inoculated and in that of the inoculated, the percentage of deaths to attacks is very high, and, as will be shown later, is much higher than the similar figures in the town of Meiktila. This high percentage of deaths to attacks may be due to the fact that the great majority of these cases occurred in remote villages, and that in few instances were the services of a trained medical man available for treatment during the attack.

The 100 per cent. mortality among the 38 cases occurring in the inoculated population of the infected villages would, however, appear to indicate something more than mere lack of skilled medical aid, because, although the figures are small and therefore relatively insignificant statistically, it is nevertheless unusual to find even among so small a group of cases of cholera a cent. per cent. mortality. There is, however, another possible explanation. When we analyse these 38 deaths among the inoculated population, we find that in each case the attack of cholera began before the end of the fifth day following preventive inoculation. In no instance during the whole epidemic was any person who had been inoculated attacked by cholera later than the fifth day following inoculation. The actual figures are given in Table VII below:—

TABLE VII.

Inoculated population in infected villages	..	32,450
Cholera attacks on 1st day of inoculation	..	10
" " " 2nd " " "	..	7
" " " 3rd " " "	..	5
" " " 4th " " "	..	4
" " " 5th " " "	..	12
" " " after 5th " " "	..	nil
Total cholera attacks in above population	..	38

A possible explanation for the 100 per cent. mortality among these 38 cases is the negative phase which follows upon an injection of vaccine. The figures suggest that the positive phase does not become established until after the 5th day following inoculation. On the other hand, some mild cases following inoculation may have been missed.

In Meiktila town, with a population of 7,231 (excluding the Cantonment) there were during the epidemic period 30 attacks of cholera giving an attack rate of 4.15, and 12 deaths giving a death rate of 1.66. Tables VIII and IX show the attacks and deaths with their rates among the non-inoculated population and the inoculated population respectively:—

TABLE VIII.

Non-inoculated population	..	2,360
Cholera attacks in above, 30.	Attack rate,	12.71
Cholera deaths in above, 12.	Death rate,	5.08

TABLE IX.

Inoculated population	..	4,871
Cholera attacks in above	..	nil
Cholera deaths in above	..	nil

In comparison with the rural figure (Table V) in Meiktila town the percentage of deaths to attacks among non-inoculated was 40. The relatively lower death rate in the town was unquestionably due to the existence of a district hospital and the presence of skilled medical attendance.

EPIDEMIC JAUNDICE (WEIL'S DISEASE) OR MALARIA IN KANDI SUBDIVISION OF MURSHIDABAD DISTRICT IN 1928.

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IN October 1928, Mr. S. C. Singha of Panchthupi village of Kandi Subdivision stated in a letter addressed to the senior writer that "in the subdivision of Kandi a new malady has been in evidence; it is like epidemic jaundice." On asking particulars from him as to the place of occurrence of such cases he informed me that the medical officer of the local S. S. Charitable Dispensary cured all the three cases which had come under his treatment. "Several other cases were treated by various other medical practitioners of the locality. The largest number of cases, some of which proved fatal, occurred at and about Kandi. Malaria is less in evidence this year owing, I think, to the excess in rainfall. The cases of jaundice have cropped up during the break which has continued since the middle of August."

The junior author of this paper was deputed to investigate the matter in the same month. He called on the Assistant Surgeon-in-charge of the Kandi Charitable Dispensary and three other private medical practitioners of the town. No acute cases of jaundice were available at the time and most of the cases that had suffered from jaundice had got over the trouble, while only one old woman had died. The history of the attack was taken of the three cases who still showed signs of jaundice, e.g., slight yellow tinged conjunctivæ, etc. The attack started with slight fever and pain all over the body in general, about three weeks before the visit, and there was no history of epistaxis or hæmoptysis or purpura. One of the patients only had a tender and enlarged liver, while all of them had enlarged spleen and one only had slightly injected conjunctivæ. Both urine and blood films were examined in all the three cases.