

THE FIFTY-SIXTH ANNUAL REPORT OF THE
SANITARY COMMISSIONER,

THE THIRTIETH ANNUAL REPORT OF THE
SANITARY ENGINEER

AND

THE TWENTY-FOURTH ANNUAL REPORT OF THE
SANITARY BOARD,

MADRAS,

1919.

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SECTION V.

GENERAL POPULATION.

RAINFALL.

The total registered rainfall of the Presidency during 1919 was 1,199.22 inches against 1,020.42 in 1918, giving a district average of 47.97 inches. This was greater than the district average of the previous year by 7.15 inches. The distribution of the year's district average among the several monsoons was as follows:—

	INCHES.
Inter-monsoon period (January to May)	5.66
South-west monsoon (June to September)	24.21
North-east monsoon (October to December)	18.10
Total	47.97

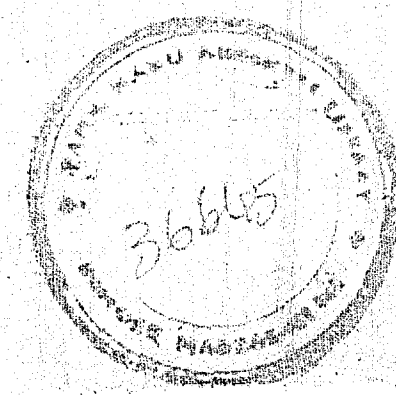
2. The average district rainfall of the year in all the monsoons was greater than the district average for forty-five years ending with 1914 by 3.89 inches. As compared with 1918, all the districts excepting Chingleput, Coimbatore, Guntūr, Madras, Nellore and Tinnevely showed an increased rainfall, Ganjām (+ 35.22) heading the list followed by Gōdāvari (+ 18.81), Vizagapatam (+ 18.67), South Kanara (+ 17.39), Malabar (+ 15.85) and Tanjore (+ 15.37). The decrease was highest in Madras (— 30.64). Compared with the average of forty-five years ending with 1914, 18 districts showed an increased and seven a decreased rainfall. The districts which showed an increase of more than 10 inches were Ganjām (+ 21.10) and Tanjore (+ 15.65). The decrease was marked in South Kanara (— 7.76 inches).

3. Considered with reference to the monsoons of the year, the inter-monsoon was almost a failure throughout the Presidency as a whole. The total registered rainfall during this monsoon, although in excess of the average by 13.61 inches, was lower than that of the previous year by 95.25 inches. Only seven districts showed an increased rainfall during this monsoon, prominent among them being Ganjām and Kistna with an increase of 2.36 and 2.35 inches, respectively, over the figures of 1918 and of 4.42 and 3.99 inches, respectively, over the average.

4. The south-west monsoon of the year gave to the Presidency a total rainfall of 605.32 inches against 572.96 inches in 1918; but compared with the average, this represents a slight decrease of 0.32 inch. Compared with 1918, the monsoon was favourable in all but two districts—Guntūr and Nellore—which

CONTENTS.

Fifty-sixth Annual Report of the Sanitary Commissioner for Madras
Thirtieth Annual Report of the Sanitary Engineer to the Government of Madras
Twenty-fourth Annual Report of the Sanitary Board, Madras



* செப்பனிடல் துறை அமைச்சர் *
* கொள்கைகள் *
* மாதம் 1919-20-ம் ஆண்டு *
* செப்பனிடல் முடிவு *
* மாதம் 1919-20-ம் ஆண்டு *
* இராஜகோவை உதவியாளர் *
* கையொப்பம் *

showed a decrease of 4.95 and 2.08 inches, respectively. In South Kanara and Malabar—the districts which fared worst during the preceding year—were recorded the highest increases of 43.68 and 35.66 inches, respectively. But when compared with the average, these two districts showed the highest decreases of 11.46 and 7.35 inches, respectively.

5. During the north-east monsoon, increased rainfall occurred in 17 districts and the decreased rainfall in eight. The increase was over 10 inches in the districts of Ganjam (+15.17), Gōdāvari (+12.67), Tanjore (+12.53) and Vizagapatam (+12.13). In other districts it ranged between 0.84 in Anantapur and 7.16 inches in North Arcot. The decrease was marked in Madras with a shortfall of 26.74 inches over the previous year's figure and of 6.23 inches over the average.

PRICES OF FOOD-GRAINS.

6. Although rainfall during the year can be considered fair, yet, owing to post-war economic stress the prices of the staple food-grains showed no tendency to fall. On the other hand, they were as high as ever. Rice was sold during 1919 at 4.7 imperial seers of 80 tolas per rupee, ragi 6.9, cholam 6.5 and cumbu 6.6 against the previous year's figures of 5.9, 12.0, 9.9 and 10.5, respectively, and against the average prices of 8.5, 14.9, 14.4 and 18.7, respectively. The prices of 1919 represent a rise of 46.8, 73.9, 52.3 and 59.1 per cent, respectively, over those of the previous year and of 80.9, 115.9, 121.5 and 107.6 per cent, respectively, over those of the average.

GENERAL POPULATION.

7. Exclusive of Europeans and Eurasians who numbered 40,928, the population of the Presidency according to the census of 1911 was 41,829,232. The population for which vital statistics were furnished for the year under report continued to be 40,005,735. The excluded number (1,823,497) consisted of the Hill tribes of the Ganjam district (341,622) and of the Vizagapatam district (1,020,977) and the inhabitants of the Laccadive Islands (10,600) of the Banganapalle State (39,343) and of the Pudukkottai State (411,855). The estimated population of the year 1919 was 44,882,056 and its natural growth, as ascertained by adding to the census figure of 1911, the excess births over deaths during the succeeding period up to the end of December 1919, resulted in a population of 43,566,421. The large difference (1,315,635) between these two figures should be attributed to the abnormal high death rate of the Presidency during 1918 on account of influenza and also to the low birth rate in the year under report.

8. Emigration during 1919 was confined to the Straits Settlements, Burma and Ceylon as in the previous year, the number emigrated being 349,404 against 242,722 in 1918. Immigrants (excluding indentured emigrants) totalled 233,295 against 218,782 in the previous year and were less than the emigrants by 116,109.

9. Registration of births and deaths was compulsory during the year in 334 unions and 2,354 villages. A wider extension of the Madras Registration of Births and Deaths Act will be necessary to ensure more reliable vital statistics in our returns. In municipalities, where registration of births and deaths is compulsory, non-medical men who do not possess the knowledge required for the correct classification of death statistics are employed and it has therefore not been possible to obtain reliable figures of deaths under several important diseases, such as typhoid, tuberculosis, malaria, etc. It is only in Madras City that medical men are employed as registering officers and this example might well be followed in other big municipalities where Health Officers are on duty.

10. During the year, there were 1,010 prosecutions for failure to report domestic occurrences in municipal towns and the fines imposed by the Magistracy amounted to Rs. 400.

BIRTHS IN DISTRICTS.

11. The total number of births registered in the Presidency during the year 1919 was 1,021,213 against 1,156,204 in the previous year, showing a decrease of 134,991 births. These figures give a birth-rate of 25.5 per mille for 1919 and of 28.9 per mille for 1918 on the census population of 1911. The recorded birth-rate of the year was also less than that of the decennial average for 10 years ending 1918 by 6.4 per mille. In the districts of Madras, South Kanara and Guntūr, the largest birth-rates of 36.6, 31.7 and 30.7 per mille, respectively, were recorded against the previous year's rates of 38.5, 36.6 and 33.6 per mille and against the decennial averages of 33.7, 36.5 and 33.2 per mille, respectively. The lowest rates were returned by Nellore (15.8) and South Arcot (19.2). In the remaining districts, the rates varied from 20.8 in Bellary to 29.7 in Malabar. Compared with the previous year, all the districts (excepting Kurnool which had an increased birth-rate of 1.2 per mille) showed a decreased rate. Births fell off by more than 5 per mille in five districts, the decrease being marked in Chingleput (—8.5). Compared with the decennial average, all the districts without a single exception showed decreased birth-rates, South Arcot showing the largest deficit of 11.1 per mille.

12. Considered with reference to sex, the proportion of male to female births was 105.2 to 100, the previous year's figures being 104.6 and 100. Mahamadanians, as usual, returned the highest birth-rate of 28.6 against 32.2 per mille in 1918. The birth-rate among Hindus was 25.3 and among Indian Christians 25.1, corresponding rates for 1918 being 23.7 and 26.9, respectively. The decreased birth-rate of the year was thus shared by all communities and was due to abnormal causes during the year as stated already.

13. The total population of the rural tracts where Act III of 1899 was in force during the year was 5,980,068 and that of those where it was not 31,266,953. These populations yielded birth-rates of 25.7 and 24.9 per mille, respectively. Of the 21 districts where the Act was in force, only ten returned rates in excess of those registered in non-compulsory areas. Increases were noticeable in Rāmnaḍ (+19.9), Chingleput (+16.5) and Salem (+10.8) while Kurnool showed the largest decrease of 15.9 per mille.

BIRTHS IN RURAL TOWNS.

14. In the 195 rural towns of the Presidency containing over 5,000 inhabitants (excluding Villupuram which was constituted into a municipality during the year) there were 43,035 births (22,273 males and 20,762 females) against 46,783 (24,140 males and 22,643 females) in 1918. Calculated on the census population of 1911 of these towns, namely, 2,069,228 (1,007,235 males and 1,061,993 females) the above figures give annual birth-rates of 20.8 and 22.4 per mille, respectively. As compared with the previous year, there was an increase in 72 towns and a decrease in 122, the rate in the remaining town of Namakkal being the same in both years. Increases were marked in Sattur (+18.6), Aruppukkottai (+17.6) and Ponnukonda (+16.4). Among those which showed a decrease, Sankaranayinarkoil in the Tinnevely district (—30.3) headed the list followed by Kovilpatti (—28.5) and Vasudevanallur (—20.2) in the same district and Poonamalle (—19.9), Tirukalikundram (—18.7) and Madurantakam (—18.0) in the Chingleput district. The birth-rate was highest in Namakkal (62.9) and lowest in Razampeta (3.6). The rates returned by these towns in the previous year were 62.9 and 11.9 per mille, respectively. Other towns which showed larger birth-rates were Kulitalai (49.2) and Dharmapuri (43.0). The rates varied from 40 to 30 per mille in 30 towns, from 30 to 20 in 70 towns and from 20 to 10 in 72 towns. Twenty towns returned rates less than 10 per mille. The above large variations in birth-rates in several of these towns should be attributed chiefly to defective registration.

BIRTHS IN MUNICIPALITIES.

15. Villupuram was newly constituted a municipality during the year, bringing the total number of towns in the Presidency under municipal administration

where compulsory registration of births and deaths was enforced by the operation of the District Municipalities Act of 1884 to 74. These municipal towns had a total population of 2,785,008 (1,386,950 males and 1,398,058 females), according to the census of 1911. The births registered in these towns during the year under report aggregated 90,553 (46,588 males and 43,965 females) against 95,447 (49,165 males and 46,282 females including the births returned by Villupuram) in 1918. These figures represent annual ratios of 32.5 and 34.3 per mille, respectively, against the quinquennial average of 36.5 per mille. Compared with the birth-rate of the rural areas, viz., 25.3 per mille the rate in municipal towns showed an excess of 7.2 per mille, due probably to better arrangements for the registration of vital statistics existing therein. The highest birth-rate of 48.2 per mille was registered in Kodaikanal against 58.0 in the previous year. The rates were also large in Dindigul (47.0), Palni (44.8), Periyakulam (43.6), Tiruvannamalai (42.8), Erode (41.3) and Bezwada (41.0). The birth-rate varied from 40 to 30 per mille in 37 towns and from 30 to 20 per mille in 26 towns. The lowest rates were returned by Peddapuram (16.2), Adoni (17.0), Villupuram (18.9) and Dharapuram (19.2). Comparing the year's figures with those of 1918, there was an increased birth-rate in only 25 towns. The increase was above 5 per mille in five towns, viz., Anantapur (+5.3), Kurnool (+5.8), Proddattur (+5.9), Nandyal (+6.2) and Chittoor (+7.8); the decrease was marked in Tirupattur (-17.1), Ongole and Cannanore (-9.3 each) and Bodinayakkanur (-9.0). Judged by the quinquennial average, only 9 towns showed an increase and 65 towns a decrease. Noticeable increases occurred in Chittoor (+11.1), Udumalpet (+7.6) and Virudupatti (+7.2) and decreases in Tirupattur (-19.4), Adoni (-13.8) and Ongole (-10.2).

DEATHS IN DISTRICTS.

16. Deaths registered during the year numbered 1,089,829 against 1,722,003 in 1918, representing annual ratios of 27.2 and 43.0 per mille, respectively, the quinquennial average being 25.3. The death-rate of the year was thus 15.8 per mille below that of the previous year and 1.9 over that of the decennial average. The highest death-rate of 53.1 per mille was recorded in Madras against the previous year's rate of 61.2 and against the decennial average of 41.9 per mille. In six other districts, the rates varied between 42.2 in Malabar and 30.2 in Gōdāvari. The lowest rates were returned by Nellore (13.0) and South Arcot (19.6). Increased death-rates occurred in the districts of Malabar, Ganjam and South Kanara, the rates being as high as 42.2, 36.7 and 38.8 per mille, respectively, against the averages of 25.3, 19.7 and 25.8 per mille and against the previous year's rates of 33.2, 30.1 and 35.1 per mille, respectively. Compared with 1918, all the other districts showed lower rates. Decreases were marked in all the Ceded Districts, Bellary heading the list with a deficiency of 71.7 per mille over the figure of 1918 and of 15.7 per mille over the average. In Anantapur, Kurnool and Onddapa, the decreases were 55.6, 52.6 and 36.4 per mille, respectively, as compared with 1918 and 10.8, 8.3 and 6.6 per mille, respectively, as compared with the average. Excepting under "Injuries" a general decrease in the average death-rate of the Presidency occurred during the year under every other head of death causation.

17. Deaths among males were larger during the year than among females, the proportion being 102.1 to 100. Racially considered, the death-rate among Muhammadans was the highest being 33.3 per mille. Hindus and Indian Christians returned 27.0 and 22.6 per mille, respectively. Corresponding figures for the previous year for all the three classes were 41.7, 43.4 and 35.2 per mille, respectively.

18. The death-rate recorded in areas where Madras Act III of 1899 was in force was 25.2 per mille and in areas where it was not 26.6 per mille. Twelve districts yielded rates in excess of those returned by the non-compulsory areas, the increase being largest in Rāmnād (+18.3). Among the districts which showed a decrease, Kurnool ranked first with a deficiency of 15.7 per mille.

19. The infantile death-rate for the districts during the year under report was less than that of the previous year and of the quinquennial average, the ratio being 192.9 per mille of registered births against 230.2 of 1918 and 198.0 of the quinquennium, showing a fall of 37.3 and 5.1 per mille, respectively. Distinguished by sex, the rate of mortality among male infants (198.5) was higher than among female infants (186.9); or, in other words for every 100 deaths, there were 52.8 male and 47.2 female deaths, showing an increase of 0.2 in the case of the former and a like decrease in the case of the latter, as compared with the previous year. The incidence of infantile mortality was the heaviest in Madras district (332.1) as in several previous years. It was also heavy in Chingleput (261.9), the Nilgiris (227.2), Tanjore (214.8), Ganjam (211.4), South Kanara (208.5), Guntur (207.2) and Malabar (203.6). Compared with the previous year, all the districts with the exception of Malabar, South Kanara and Ganjam which showed an increase of 27.7, 4.8 and 3.2 per mille respectively, showed a decreased rate of infantile mortality, Nellore (-161.8) heading the list followed by Anantapur (-120.0), Kurnool (-110.5), Bellary (-79.7) and Coimbatore (-71.9). Judged with the quinquennial average, 13 districts showed a decrease and 7 an increase. Here also, the increase was prominent in Malabar (+32.8) and the decrease in Nellore -57.2).

DEATHS IN RURAL TOWNS.

20. A total of 44,595 deaths was registered during the year in the 195 rural towns of the Presidency containing over 5,000 inhabitants against 68,275 in 1918. Calculated upon the census population of 1911, these figures give annual ratios of 21.6 and 32.7 per mille, respectively, against the quinquennial average death-rate of 23.3 per mille. The highest death-rate of 60.6 per mille was recorded in Namakkal in the Salem district against 70.6 per mille in 1918. Death-rates were also high in Dharmapuri (60.2), Kulittalai (55.4), Russellkonda (52.3), Sattur (51.0) and Tiruvallur (50.9). In seven other towns the rates ranged from 40.5 in Ambur to 47.6 in Badagara and in twenty-seven they were between 30 and 40 per mille. Of the 26 towns where the rates were below 10 per mille, the lowest rates were returned by Tiruvattur (2.8), Vempalli (3.1), Bukkapatnam (3.9) and Razampet (4.5), a clear indication that registration arrangements in these towns are not as they should be.

21. Compared with the previous year 32 towns showed an increase and 162 towns a decrease, the rate in the remaining town of Karaikudi being identical. Increases were prominent in Russellkonda (+21.7), Kasaragod (+19.2) and Sompeta (+17.0) and decreases in Kalyandrug (-100.8), Harpanahalli (-97.7), Rayadrug (-84.6), Kosgi (-82.8), Yadiki (-53.6), Dharmavaram (-49.8) and Siruguppa (-42.2).

DEATHS IN MUNICIPALITIES.

22. Deaths registered in the 74 municipal towns of the Presidency during the year numbered 109,464 against 140,265 (including the deaths returned by Villupuram) in 1918, representing annual ratios of 39.3 and 50.6 per mille, respectively, against the quinquennial average of 37.8 per mille. The highest death-rate of 81.6 per mille was returned by Tirupattur as in the previous year; the other towns showing comparatively higher death-rates were Palni (64.3), Bezwada (63.8), Calicut (59.4), Madras (53.1), Tellicherry (52.6) and Dindigul (51.3). The rates varied from 50 to 40 per mille in seven towns, from 40 to 30 in forty-five and from 30 to 20 in twelve. The lowest rates were returned by Adoni (10.3), Bodinayakkanur (13.8) and Villupuram (16.3). As compared with the results of the previous year, increased death-rates occurred in nine towns, viz., Calicut (+16.6), Tellicherry (+13.5), Palni (+11.2), Parlakimedi (+9.9), Cannanore (+5.4), Berhampur (+4.4), Madura (+2.1), Villupuram (+1.1) and Chitacole (+0.7). All other towns showed decreased death-rates. Decreases were prominent in Nandyal (-76.0), Bodinayakkanur (-39.7) and Tirupattur (-36.8). Considered with reference to the quinquennial average, the death-rate of the year showed an increase in 42 towns and a decrease in 31

towns, the remaining town of Vizagapatam returning the same death-rate in both cases, viz., 35.3 per mille. The increase was marked in Calicut (+ 26.3) and the decrease in Bellary (- 35.0).

23. The total infantile mortality in municipalities during 1919 averaged 246.2 per mille of the registered births against 232.1 in 1918, the quinquennial average being 252.0 per mille. Distinguished by sex, the mortality among male infants was 257.9 and among female 233.9, or in every 100 deaths there were 53.9 males and 46.1 females. Rates of infantile mortality were very high in Bezwada (374.6), Vizagapatam (347.2), Madras (332.1), Guntūr (303.1) and Berhampur (301.3). The rates varied from 300 to 250 per mille in 11 towns, from 250 to 200 in 34 towns, from 200 to 150 in 16 towns and from 150 to 100 in 7 towns. Excluding Villupuram, which returned an infantile death-rate of only 75.2 per mille, evidently due to defective registration obtaining before its constitution as a municipality towards the close of the year, the lowest infantile death-rate was recorded in Adōni (104.3). Comparing the year's returns with those of 1918, there was an increase in 16 towns and a decrease in 57. In contrast with the quinquennial average, increased mortality among infants occurred in 33 towns and a decreased mortality in 40. The towns which showed marked increases were Vizagapatam (+ 83.0), Tiruppattur (+ 60.5), Berhampur (+ 58.5) and Calicut (+ 54.6). Decreases were over 100 per mille in Udumalpet (- 198.5), Adōni (- 136.8), Cuddalore (- 118.3), Anantapur (- 114.6), Hospet (- 103.1) and Masulipatam (- 100.7). The continued heavy mortality rates among infants should be attributed to the same causes as those enumerated in paragraph 25 of the last year's administration report.

SECTION VI.

GENERAL HISTORY OF CHIEF DISEASES.

CHOLERA.

24. The total number of deaths from cholera in districts was 98,262 against 122,263 in 1918 and 58,939 in 1917, representing annual ratios of 2.3, 3.0 and 1.5 per mille, respectively, the quinquennial average being 1.5 per mille. The disease was present in every district of the Presidency and existed throughout the year in all the districts, except the Ceded districts, the Nilgiris and South Arcot. In twenty-two districts it was a continuation of the epidemic that broke out in the previous year. South Kanara and Ganjām, the districts which returned the lowest death-rate of 0.6 per mille each in 1918, fared worst during the year under report, the death-rates in the said districts being 7.1 and 5.6 per mille respectively against the quinquennial averages of 0.2 and 0.6 per mille respectively. Death-rates were also high in Malabar (5.0), Cuddapah (4.0), Chittoor (3.9), Chingleput (3.3) and North Arcot (3.1). In four districts the rates varied between 3 and 2 per mille and in nine between 2 and 1 per mille and in each of the remaining five districts, the rate was below 1 per mille. As compared with the previous year, all the districts excepting South Kanara, Ganjām, Malabar, Vizagapatam, Madras and Chingleput showed decreased death-rates. Bellary showed a noticeable decrease, the death-rate recorded therein being 0.1 per mille in 1919 against 4.7 in 1918 and 2.4, the quinquennial average. The incidence of cholera mortality throughout the Presidency was heaviest in the months of January and July.

25. In the year under report, cholera was present in 139 rural towns and claimed 3,995 victims against 7,670 in 169 towns in 1918, representing annual ratios of 1.9 and 3.7 per mille, respectively. Sriperumbudur in Chingleput district returned the highest death-rate of 17.6 per mille. Other towns where death-rates were comparatively heavy were Vartirayaruppu (17.2), Badagara (15.6), Madurantakam (12.0), Srungavarapukota (10.9), Wandiwash (10.8), Ponnani (10.4), Tekkali (10.3) and Kasaragod (10.1).

26. From 68 municipal towns, 5,461 deaths from this disease were reported against 7,062 in 69 towns in 1918, yielding annual ratios of 2.0 and 2.6 per mille, respectively. The death-rate was highest in Proddattur (13.8 per mille). Other towns which showed comparatively higher death-rates from this cause were Palni (11.4), Calicut (9.2), Tellicherry (8.6) and Cochin (8.4). Udumalpet returned only one sporadic case, Anantapur, Ongole, Masulipatam and Kurnool two cases each and Periyakulam and Villupuram three each. Five towns which were affected in the previous year were free from the disease during the year under report.

27. Out of 42,052 towns and villages in the Presidency, deaths from cholera were reported from 8,289 as against 8,600 in 1918.

28. The rules issued with G.O. No. 1658 M., dated 21st September 1916, for combating epidemics of cholera continued to be in operation in all municipal towns and their working was so far satisfactory. There were few cases in which the local authorities were not prompt in giving effect to these rules immediately after the occurrence of first cases of cholera. This should be guarded against.

29. Two additional cholera parties were sanctioned during the year (G.O. No. 1033 L., Mis., dated 26th August 1919) bringing the total number of parties at work in the Presidency to eight. Three of these have been made permanent

and five continue to be temporary. The necessity for confirming the temporary parties and for revising the scale of pay and allowances admissible to the Sanitary Inspectors belonging to these parties is great and is deserving of early consideration. The eight parties were employed during the year under report in all the districts excepting Vizagapatam, Cuddapah, Bellary, Anantapur, Chittoor, Coimbatore and the Nilgiris and did some useful work in combating the spread of cholera and in bringing home to the village folk the need for adopting sanitary measures during times of cholera prevalence.

30. The chief measures adopted by the parties for combating the spread of cholera were hankinisation of drinking water-supplies and their subsequent protection as far as possible from contamination; isolation of infected patients and disinfection of their homes, clothing, etc.; administration and distribution of medicines and education of the masses as to the causes of spread of cholera and the advantages of attending to personal hygiene and surroundings. These measures were, on the whole, viewed favourably by the people at large. Sir Leonard Roger's method of treatment of cholera by saline injection was also attempted in a few cases but this treatment was not found popular with the general population. There are several directions in which the working of these parties can be improved in order to justify the large expenditure incurred on their account and this is engaging attention.

31. A statement giving a list of municipal towns which have protected water-supplies is attached (Appendix XIII). A perusal of this makes it plain that mortality from cholera has been on the decrease since the introduction of a piped water-supply system in those towns.

SMALLPOX.

32. Smallpox contributed 41,732 deaths against 58,752 in 1918 with annual ratios of 1.0 and 1.5 per mille respectively against the quinquennial average of 0.8 per mille. No district escaped the disease during the year; and in all of them it was continuously present throughout the year. The Nilgiris returned the highest death-rate of 2.6 per mille against 1.0 in the previous year. Other districts where comparatively high death-rates from this cause prevailed were South Kanara (2.3), Bellary (2.1) and Gōdāvari (1.7). In nine districts the rates varied from 1.5 to 1.0 per mille and in each of the remaining twelve districts the rate was below 1 per mille. Of the deaths registered under this head 12,311 were under one year of age and 13,538 from 1 to 10 years of age or 29.5 and 32.4 per cent respectively of the total mortality from this cause against 32.3 and 34.2 per cent in 1918. The incidence of mortality from this disease was heaviest during January—June 1919.

33. One thousand one hundred and eighty-four deaths from this cause were reported from 132 rural towns against 1,762 in a similar number of towns in 1918, representing annual ratios of 0.6 and 0.8 per mille, respectively. The highest death-rate was recorded in Kasaragod (9.3) followed by Ponnani (7.7), Muthupet (6.1) and Amalapuram (5.4).

34. Nine municipal towns were free from the disease during the year under report. The remaining 65 municipalities had a total of 4,563 deaths against 5,953 in the previous year. These figures yield annual ratios of 1.6 and 2.1 per mille, respectively. In nine towns the total number reported throughout the whole year did not exceed five in each. The death-rate was highest in Rajahmundry (9.4). Next on the list were Mangalore (7.1), Calicut (6.5), Periyakulam (6.1), Gudiyattam (5.7) and Coonoor (5.5).

35. Smallpox cases were reported during the year from 7,000 towns and villages against 6,516 in the previous year. In rural towns, the death-rate from this cause was 0.6 per mille and in rural tracts 1.0 per mille while in municipal areas it was 1.6 per mille. These large variations may be attributed to the indifferent arrangements existing in the several local areas for the registration of vital statistics.

PLAGUE.

36. Deaths from plague fell from 12,859 or 0.3 per mille in 1918 to 5,645 or 0.1 per mille in 1919, the quinquennial average death-rate being 0.3 per mille. Only four districts were completely free from the disease during the year under report. In three districts, there were in all three imported cases and in the remaining 18, the disease was present in an indigenous form. Bellary was on the infected list throughout the year and the death-rate registered in the district was the highest, being 1.6 per mille against 5.1 in 1918 and 4.3, the quinquennial average. Other districts where death-rates were comparatively high were Coimbatore (0.7), Guntūr and Madura (0.3 each) and the Nilgiris, North Arcot and Salem (0.2 each). As compared with the previous year, mortality from this disease showed the largest decline of 3.5 per mille in the Bellary district.

37. From 18 rural towns, 401 deaths from plague were reported against 1,893 in 37 towns in 1918 representing annual ratios of 0.2 and 0.9 per mille, respectively. The towns of Kosgi, Rameswaram and Rasipuram had a single imported case in each. The largest death-rates were returned by Kotturu (6.1), Kadiri (5.3), Vetapalam (4.2), Ambur (3.8), Dharmavaram (3.7) and Palladam (3.6).

38. The number of municipal towns affected with plague during the year was 26 against 36 in 1918. These towns returned 1,460 deaths against 2,000, giving annual ratios of 0.5 and 0.7 per mille respectively. Hospet, Tirupati, Tirunur, Cocanada, Bezwada, Cochin, Walajapet, Negapatam and Tuticorin reported one imported case each and Vaniyambadi two cases. In the remaining 16 towns from which indigenous cases were reported, the highest death-rates were recorded in Tirapattur and Dharapuram, the figures being 23.4 and 14.5 per mille respectively in 1919 against 7.6 and 0.1 in 1918. Next on the list were Paimi (13.2) and Dindigul (9.2) which were free from the disease during the previous year, Udamalpet (7.3) and Guntūr (5.4).

39. Deaths from plague were reported from 363 towns and villages against 764 in 1918.

40. Among persons who have been previously inoculated with anti-plague vaccine, there were 11 deaths against 26 in 1918.

FEVERS.

41. Under "Fevers," 403,499 deaths were registered against 896,088 in 1918, representing annual ratios of 10.1 and 22.4 per mille, respectively, the quinquennial average being 10.5. The large falling off in the number of deaths from this cause as compared with 1918 was due to the absence during the year under report of influenza that was so widely prevalent during the previous year and the consequent low death-rate. Largest death-rates under this head were recorded in Ganjām (25.7), Vizagapatam (22.0), Gōdāvari (16.7) and Malabar (15.1). As compared with 1918, all the districts except Ganjām and Malabar which showed an increased mortality rate of 0.3 per mille each, showed decreased rates under "Fevers." Decreases were prominent in the Ceded districts—Bellary (—55.4), Kurnool (—43.6), Anantapur (—42.2) and Cuddapah (—28.7). Compared with the quinquennial average there was an increase in 14 districts, Ganjām (+ 9.3) and Malabar (+ 6.0) showing the highest increases. The largest number (44,636) of deaths from fevers was recorded in the month of January.

42. A total of 18,243 deaths from fevers was reported in 194 rural towns against 27,525 in 1918 yielding annual ratios of 6.4 and 13.2 per mille, respectively. The mortality rates were largest in Russellkonda (34.3), Bobbili (24.9) and Dharmapuri and Yellamanchili (22.0 each). In 29 towns the rates varied from 10.2 in Tekkal and Tanuka to 19.5 in Tirumangalam.

43. Nineteen thousand two hundred and twenty-eight deaths from this cause were registered in the 74 municipal towns against 37,899 in 1918, representing annual ratios of 6.9 and 13.7 per mille, respectively. The highest mortality rate was recorded in Nandyal and Parlakimedi (17.0 each) against 77.5 and 12.7, respectively, in 1918. In 13 other towns the rates varied from 10.1 per mille in Berhampur to 15.6 per mille in Narasaraopet.

MALARIA.

44. The Malaria Board of the Presidency existed only in name, there being no executive officer to work under them. No malaria investigations were therefore undertaken during the year under their direct control nor anti-malarial measures carried out on a large scale. It is only in Madras City and Bangalore and its surroundings in the Chingleput district that anti-malarial operations on a somewhat large scale were undertaken during the year. The results obtained in these tracts are satisfactory.

45. Itinerating dispensaries were at work during the year in the district of Nellore and Dhone taluk in the Kurnool district. The work turned out by these dispensaries was only spasmodic due to the paucity of properly trained medical men for their charge. To be of value these itinerating dispensaries need remodelling.

DYSENTERY AND DIARRHOEA.

46. Under this head, there was a total of 74,074 deaths in 1919 against 79,841 in 1918 with annual ratios of 1.9 and 2.0 per mille, respectively, against the quinquennial average of 1.7 per mille. The largest number of deaths under the head was registered as usual in Madras which had a mortality rate of 11.4 per mille. The rates were also larger in Malabar (5.6), the Nilgiris (5.0), South Kanara (4.7), Chingleput (3.2), Coimbatore (2.5) and North Arcot (2.4). As compared with the previous year, there was an increase in four districts and a decrease in 19, the death-rates in the remaining two districts being identical. Malabar showed the largest increase of 2.7 per mille when compared with 1918 and 2.3 per mille when compared with the quinquennial average.

47. Two thousand eight hundred and eighty-three deaths from these causes were registered in 170 rural towns against 3,267 in 1918 with annual ratios of 1.4 and 1.6 per mille, respectively. The death-rates were largest in Tiravallur (7.4), Tiruvotiyur (7.0), Srungavarappukota (6.1), Tekkali (5.9), Sattur (5.8) and Namakkal (5.0).

48. The mortality registered under this head in the 71 municipal towns amounted to 15,023 against 15,629 in 1918, the annual ratios being 5.4 and 5.1 per mille, respectively. The largest death-rates were returned by Madras (11.4), Vizianagram (10.5), Vizagapatam (10.0), Cochin (9.8), Chingleput (9.5) and Dindigul (9.3). In 18 towns the rates varied from 5.0 per mille in Gudiyattam to 8.9 per mille in Palamcottah. Compared with the previous year, there was an increase in 21 towns and a decrease in 50, the rates in the remaining three towns being the same in both years. The municipal death-rate from these two causes exceeded the rural death-rate by 3.8 per mille.

49. Deaths from dysentery and diarrhoea were reported from 14,047 towns and villages against 14,271 in 1918.

RESPIRATORY DISEASES.

50. Deaths registered from this cause aggregated 48,984 in 1919 against 43,199 in 1918, representing annual ratios of 1.2 and 1.6 per mille, respectively, against the quinquennial average of 1.2 per mille. As in the previous nine years, Madras headed the list with a mortality rate of 10.2 per mille. The rates were also large in the Nilgiris (4.3) and Kistna (3.0) as in the previous two years. Compared with the quinquennial average, there was an increase in 11 districts and a decrease in 9, the rates in the remaining districts being the same.

51. Two thousand and seventy-six deaths from respiratory diseases were registered in 145 rural towns against 2,456 in 1918, with annual ratios of 1.0 and 1.2 per mille, respectively. The death-rate was largest in Sholinghur (3.2). It was also large in Jaggayapet and Saidapet (5.6 each), Nuzvid (5.4), Tiruvallur (5.2) and Tanuku (5.1).

52. A total of 10,391 deaths from respiratory diseases was reported during the year against 12,933 in 1918 yielding annual ratios of 3.7 and 4.7 per mille,

respectively. The largest death-rate was returned by Madras (10.2) as in the previous year followed by Cochin (7.3), Ootacamund and Tirupati (7.7 each), Coonoor (6.9), Conjeevaram (6.8) and Tellicherry (6.3). Twelve towns reported no deaths from this cause. Out of 42,052 towns and villages, 10,926 returned deaths from this cause against 13,211 in 1918.

INJURIES.

53. The deaths returned under this head numbered 8,445 against 8,405 in 1918, the annual ratio being 0.2 per mille in both the years. The mortality rate for rural towns was 0.2 per mille and that for municipal towns 0.4 per mille. Suicides among males numbered 565 and among females 583.

54. A total of 62 deaths from rabies was registered during the year under report against 74 in the previous year.

ALL OTHER CAUSES.

55. Deaths registered from this head aggregated 414,188 against 480,596 in 1918 and they represent annual ratios of 10.4 and 12.0 per mille, respectively. About 88 per cent of the total mortality in the Presidency during the year was classified under this all-absorbing head. The death-rate from these causes exceeded 10 per mille in 14 districts. Of the 11 districts which showed a death-rate of below 10 per mille, comparatively fewer deaths were registered in Vizagapatam (1.3), Ganjam (2.3), Nellore (4.3), Cuddapah (4.5) and Kurnool (5.1) while the death-rates in these districts from "fevers" were proportionately higher.

56. In rural towns a total of 20,517 deaths was registered in 1919 against 23,442 in 1918, representing annual ratios of 9.9 and 11.2 per mille, respectively. In municipal towns, the death-rate under this head was 18.8 per mille against 20.8 per mille in 1918. It exceeded 20 per mille in 20 towns, was between 10 and 20 per mille in 43 towns and was below 10 per mille in 11. The highest rate was recorded in Bezwada (39.3) and the lowest in Adoni (4.9).

SECTION IX.

SANITARY WORKS—CIVIL.

MUNICIPALITIES.

57. The municipalities continued to be administered under the District Municipalities Act IV of 1884 and its provisions were extended to the major union of Villupuram during the year, thus raising the number of municipalities from 73 to 74 with an aggregate population of 2,799,530.

58. The attached statement shows the progress made in water-supply and drainage schemes:—

Statement showing the position of Municipal Water-supply and Drainage Schemes in 1913.

Water-supply.				Drainage.			
Opened.	Under execution.	Sanctioned.	Under investigation; investigation ordered or plans and estimates submitted or being revised under orders or held over for want of funds or other causes.	Opened.	Under execution.	Sanctioned.	Under investigation; investigation ordered or plans and estimates submitted or being revised under orders or held over for want of funds or other causes.
Adasi. Berhampur. Berwada. Chidambaram. Cocanada. Conjeevaram. Coonoor. Cuddapah. Dindigul. Erode. Gudiyaltham. Guntur. Kodakāṇḍal. Kumbakōṇam (partial). Kurnool. Madura. Masulipatam. Negapatnam. Nellore. Ootacamund. Periyakulam. Salem. Tanjore. Tirupati. Trichinopoly. Vellore. Vizagapatam (including Waltair). Vizianagram.	Adasi (improvements). Amantapur. Bellary (fall power test). Chingleput. Cuddapah (improvements). Guntur (Water works improvements). Madura (improvements). Narasaraopet. Tirupati. Tuticorin (Tanjorepurani scheme). Vizagapatam (water works improvements).	Conjeevaram (water works improvements). Coonoor. Coimbatore (Police Recruits' school). Ootacamund (water supply, southern portion). Salem (widening supply channel to Pannamuratupatti). Tanjore (improvements). Vellore (water works improvements).	Bellary. Chidambaram. Chittoor. Coimbatore (Sircami scheme). Coimbatore (Forest College). Cuddalore. Dharmapattam. Dindigul (water works improvements). Kodakāṇḍal (extension). Mangalore. Mannargudi. Nandyal. Ongole. Palghat. Palni. Pudukottai. Rajahmundry. Salem (improvements). Srirangam (separate scheme). Srivilliputtur. Tirupattur. Tiruvallur. Tiruvannamalai. Trichinopoly (improvements). Vaniyambadi. Waltair.	Ootacamund. Madura. Vellore.	Kumbakōṇam (Part I Conservancy lanes).	Adasi. Amantapur. Bellary. Berhampur. Berwada. Bhimlipatam. Dallam. Chingleput. Chidambaram. Chingleput. Chittoor. Cocanada. Coimbatore. Cuddapah. Erode. Guntur. Kumbakōṇam (Part II). Kurnool. Mangalore. Mannargudi. Nandyal. Negapatnam. Ootacamund (improvements to main sewer). Ootacamund (improvements to septic tank). Paddanapuram. Periyakulam. Rajahmundry. Salem. Srirangam. Tanjore. Tellicherry (Chalk). Tenali. Tiruvallur. Tirupati. Trichinopoly. Vaniyambadi. Vizianagram.	

It will be seen that two towns—Erode and Erode—were provided with a piped water-supply. As regards drainage, the only municipality which possesses a completed drainage scheme is Ootacamund. The result of its working is, however, unsatisfactory and the question of the improvement of its working is under consideration. The drainage schemes in Madura and Vellore were still under execution, when the year closed. Conditions as to water-supply and drainage in the other towns were very much the same as recorded in the previous year. Thus it will be seen that the majority of our municipalities are deficient in the two most important factors of sanitation, viz., protected water-supplies and efficient drainage systems, and until these deficiencies are made good the application of measures to safeguard public health is beset with difficulties and can only be palliative.

59. The details of the major works carried out during the year are given in the report of the Sanitary Engineer to Government.

60. From particulars furnished by municipalities it is observed that there was a larger supervising sanitary staff employed during 1913 than in the previous year, the increase occurring chiefly among sanitary inspectors and peons. There was a fall in the number of sanitary overseers and sanitary maistris. As regards the menial conservancy staff there was a slight fall in the number of sweepers and a rise in the number of scavengers. Among individual municipalities the inadequacy of both the supervising and menial staff is still apparent and the deficiencies have been brought to notice when reviewing the budget estimates and in the inspection notes. Year after year attention has been drawn to the importance of employing an adequate staff for sanitary purposes, but to little purpose in most cases, the plea urged for not rectifying the defect being 'want of funds.' The plant employed for the removal of night-soil and rubbish in most municipalities is very unsatisfactory—being not only inadequate but of the most primitive description and much the worse for wear. Although Government have in G.O. No. 623 M., dated 21st April 1913, issued instructions for the formation of a depreciation reserve fund for the renewal and repair of conservancy plant, most municipalities have not paid much attention to the matter trusting to the generosity of Government to provide the necessary funds for the purpose by grants from Provincial revenues when the plant has become hopelessly unserviceable. The result is that with an inadequate staff and unsatisfactory plant the conservancy of the towns suffers and is a reproach to the municipal administration.

61. The scheme of employing health officers for supervising sanitation made no progress during the year, several towns for which second-class health officers were sanctioned not having employed them owing to the unwillingness on the part of medical graduates to accept service under municipalities. It was hoped that after the war there would be a number of candidates for employment as health officers, but this hope has not been realized; obviously the service is not attractive. Unless the question of the appointment, pay, terms of service, etc., of municipal health officers is placed on a satisfactory footing, the popularity of the service will not improve. For the present it is hoped that the decision arrived at the recent Municipal Conference to provincialize the service will to some extent solve the difficulty now experienced in recruiting them. Similarly considerable difficulty is experienced in recruiting sanitary inspectors. Although a large number of men (1,174) have qualified up to date local bodies find it difficult to fill up sanctioned appointments—these men preferring other employment to service under municipalities or local boards. The result is that unqualified men have to be employed as provided for by G.O. No. 2013 L., dated 21st November 1913. That this is undoubtedly due to the inadequacy of the pay offered by municipalities is shown by the fact that no difficulty is met in recruiting for the cholera parties or the vaccination department.

62. It is satisfactory that some activity is noticeable in providing increased public latrine accommodation of an improved type. The total number of all description of latrines amounted to 1,793 against 1,775 in the previous year. Of these 1,223 against 1,176 were type design and pucca built non-type design latrines with seats,

drains, etc. The number of insanitary latrines was still large, but these are being gradually replaced by type design latrines.

63. The public latrine accommodation in most municipalities was adequate for the requirements of the population, but in 22 it was deficient, the deficiency being mostly in Calicut, Palghat, Masulipatam, Madura, Bodinayakkanur, Ellore and Tiruvālūr; in the remaining 16 towns the deficiency varied from 1 in Cannanore and Bezvada to 7 each in Rajahmundry, Vellore and Hospet.

64. There was also an increase in the number of private latrines from 158,836 in 1918 to 161,498 in 1919. Of the total number of private latrines no less than 148,641 or 89.6 per cent were conserved by municipal agency under the private scavenging system which shows an advance over the previous year. It is observed, however, that whilst municipal councils have shown considerable enterprise in extending the private scavenging service, they were not equally energetic in enforcing section 207 of the Municipal Act in the matter of private latrines as shown by the fact that only 39.8 per cent of the houses assessed to the tax on buildings were provided with the convenience of private latrines, the most backward in this respect being Narasaraopet, Bodinayakkanur, Hospet, Proddatur, Villupuram, Tiruvālūr and Nandyal, where the percentage varied from 5 to 10. All of these with the exception of Hospet and Nandyal are, however, comparatively new municipalities, but in 15 of the older towns the percentage was below 25. The private scavenging system is in need of increased attention in the Municipalities of Erode, Tiruppur, Udumalpet, Chittoor, Virudupatti and Peddapuram. By a more rigorous enforcement of the law efforts should be made to insist upon the house owners providing latrine accommodation in their houses and to bring as many of them as possible under the municipal private scavenging service.

65. There was little change in the conservancy arrangement in vogue. Conservancy was worked on the contract system in most municipalities and the rubbish and night-soil were stacked and trenched in depots and sold by auction and where there was a demand for this form of manure for agricultural purposes the sale-proceeds brought in a fair return, but in others, much of this valuable product went to waste, although with a little enterprise, it should be possible to turn it to good account and make it a valuable asset which might be a set off against the expenditure on conservancy and provide funds for the acquisition of sites for the extension and improvement of rubbish and night-soil depots. The conversion of night-soil into poudrette has not found favour in this Presidency although attention was drawn to the matter years ago.

66. Little attempt was made to raise crops on the night-soil trenching ground except in Bellary, Trichinopoly and Tuticorin. In the two former the trenching ground was leased out and grass crops were raised whilst in Tuticorin, the crops raised consisted of vegetables, etc. The chief obstacle to the system is the difficulty of water for irrigating the crops.

67. There was little progress made in sewage farming and the remarks made in the reports of previous years are repeated. This method of disposing of sullage was in force in the municipalities, where extensive disposal works exist, viz., Ootacamund, Mannārgudi, Tuticorin, Chingleput, Anakāpalle, Chicacole, Nandyal, Conjeeveram, Kumbakōnam, Guntūr, Negapatam, Rajahmundry and Vizianagram. In Tuticorin the sewage is collected in a cistern and thence passed over a bacterial filter the effluent being used for irrigation. The crops raised on the sewage farms consist of various kinds of vegetables, plantains, grasses, etc. In Ootacamund rye grass is grown. The expenditure on the Ootacamund farm far exceeded the income.

68. The aggregate allotment and expenditure on sanitation for the nine months ending December 1919 amounted to Rs. 32,63,874 and Rs. 22,08,300 against Rs. 29,88,311 and Rs. 20,85,113, respectively. The provision for sanitation was 44 per cent of the available income of all municipalities, whilst the expenditure amounted to 68.4 per cent of the allotment, leaving about 32 per cent of the allotment to be expended in the remaining three months of the year. Of the total allotment, Rs. 4,92,160 was set apart for the improvement of water-supply,

the remainder being allocated to conservancy, construction and repair of drains, markets, slaughter-houses, latrines, sanitary arrangements during fairs and festivals, etc. The allotment and expenditure for the full year 1918-19 amounted to Rs. 29,75,122 and Rs. 28,05,870 respectively.

DISTRICT BOARDS.

69. The following statement shows the efforts made for providing a protected water-supply and efficient drainage in the rural areas:—

Statement showing the position of Water-supply and Drainage Schemes in Rural Areas in 1919.

Opened.	Under execution.	Sanctioned.	Under investigation, investigation ordered or plans and estimates submitted or being revised under orders or held over for want of funds or other causes.
Water-supply.			
Nil.	Gudur Rameswaram	Nil.	Arcoot. Aruppukottai. Alagarkovil (Madura district). Bodinayakkanur. Gobichettipalayam. Guntakal. Hindupur. Kalahasti. New Engineering College, Guindy. Madakasira. Mettupalayam. Palacole. Pannuti. Pennkonda. Peddapuram. Pollachi. Ranipet. Salem. Tiruppur. Tiruchanur. Udumalpet. Urvakonda.
Nil.	Nil.	Drainage. Nil.	New Engineering College, Guindy. Lunatic Asylum, Madras.

70. No material progress is noticeable in respect of water-supply and drainage, the chief difficulty being the lack of funds. The condition of water-supply and drainage in rural areas has been frequently reported upon and needs no recapitulation—conservancy is no better. It is hoped that the amended Local Boards Act and the efforts that are being made by the Health and Welfare Associations to spread a knowledge of sanitation will improve matters. The District Boards of Gōdāvari and Kistna dispensed with the services of their sanitary assistants during the year and these subordinates were employed only in the District Boards of Tanjore and North Arcot.

71. The number of unions and other villages where conservancy arrangements existed rose from 1,219 in 1918 to 1,306 in the year under report. Of these 1,148 were unions and 158 were non-union villages. Calculated on the total number of villages, only 2.5 per cent of them were conserved.

72. The total assignment for sanitation during 1919 amounted to Rs. 17,74,860 which was 26.4 per cent of the income and the expenditure during the nine months of the official year for which information is available was Rs. 8,12,495. In other words the expenditure was 45.7 per cent of the allotment. The largest assignment was made for the improvement of water-supply, viz., Rs. 6,52,957. The District Boards of Trichinopoly and Salem made the best use of the sanitary allotment having spent 78 and 71 per cent of it during the nine months. The allotment and expenditure for the full year 1918-19 were Rs. 16,10,368 and Rs. 10,53,609 respectively.

73. *Maintenance of village sanitary inspection book.*—This record is maintained in all the districts except Malabar, South Kanara, the Nilgiris and Koraput where there are no unions. The District Medical and Sanitary Officers of Vizagapatam, Gōdāvari, Kistna and Coimbatore report that the book is not properly maintained in these districts. No information has been furnished by the District Medical and Sanitary Officer of North Arcot. The revision of this book is now under consideration.

74. *Mecca pilgrimage.*—Nil.

SECTION X.

GENERAL REMARKS AND PERSONAL PROCEEDINGS.

75. The post of Sanitary Commissioner was held by Major Justice up to the 12th February 1919 when he proceeded on combined privilege leave and furlough handing over charge to Dr. Matthew, Deputy Sanitary Commissioner, Central Range. In the month of January, Major Justice proceeded with the permission of Government to attend the Science Congress at Bombay. Dr. Matthew was relieved on 15th February 1919 by Lieut.-Col. Ross, I.M.S. During the period he held office, he proceeded on the 18th February to Guntūr to examine and report on the drainage arrangements of the Municipal Hospital there and opportunity was taken also of inspecting a few of the sanitary schemes and the head water-works. In March he made a routine sanitary inspection of the municipalities of Ellore, Vizianagram and Berhampur where he inspected also the sanitary schemes and the head water-works returning to headquarters on the 24th March. En route to Vizianagram and Berhampur he halted at Vizagapatam and inspected the head water-works. He then made a brief inspection of the anti-malarial work at Ennore and its surroundings and at the request of the Collector of Chingleput, the extension site at Ambattur. In April he proceeded on privilege leave and was relieved on the 16th April by Major M. J. Quirke, I.M.S., on return from Military duty. On the 27th April, Major Quirke visited Dindigul to report on the question of the exclusion of certain sites from the municipal limits and on certain sanitary works the Municipal Council had in view. In May he made a routine sanitary inspection of Kodaikānal Municipality and submitted a written report thereon. Returning thence he proceeded to Ootacamund to confer with Government on certain matters which were to be discussed at the informal Conference of Sanitary Commissioners at Simla. On the 18th May, he journeyed to Simla to attend the Medical and Sanitary Conference which was to assemble there. On his return journey from Simla, he took the opportunity of examining the working of the mechanical filters at Poona returning to Madras on the 6th June. Meanwhile Lieut.-Col. Ross had rejoined from privilege leave on the 23rd May and Major Quirke was considered as on deputation from that date until the 6th June when he again assumed charge of the Office of Sanitary Commissioner. On the 17th June, he at the request of the Surgeon, inspected and reported upon the drainage arrangements of the Guntūr Municipality in company with the Sanitary Engineer. Thereafter he inspected the localities for which certain drainage proposals were under the consideration of the Sanitary Engineer. In July Major Quirke made an inspection of certain famine areas in the Ganjam district when he inspected the kitchen at Kallikotta and the villages of Bijapet, Langaleswar, Theladia, Mathura and Tirida returning to headquarters on the 25th July. He then proceeded on leave on the 4th August and was relieved by Dr. Matthew who held charge up to the 23rd. During the period he inspected Salem for the inspection of the sites proposed for the sewage farm and septic tank in the Salem drainage scheme in respect of which a report was due to the Sanitary Board. Opportunity was at the same time taken of inspecting certain proposals of the municipality for improving the drainage of a locality where there was much stagnation of sullage and storm water. The attention of the Chairman, Municipal Council, Salem, was also drawn to the unsatisfactory condition of the rubbish depot on the Attampatti Road. On the 22nd August, Dr. Matthew was under the orders of Government relieved by the Hon'ble Surgeon-General G. G. Giffard who continued in charge until the end of the year.

During the period he visited Hospet, Kamalapuram, Bellary, Nandyal, Guntūr, Bapatla (Stuartpuram), Tenali, Ongole, Coimbatore, Ootacamund, Salem, Cocanada, Ellore, Kavali (Criminal Settlement), Nellore, Tanjore and Trichinopoly.

These visits synchronized with his inspection as Surgeon-General and although no detailed sanitary inspection of these localities were made, he met the Chairmen of the Municipal Councils concerned, went round the towns and examined and discussed with them the salient sanitary defects and advised remedial measures. He examined also the sanitary works sanctioned or under contemplation by the Municipal Councils.

In addition to the above and inspections carried out at headquarters and attending to routine office work, meetings and Conference convened for discussion of sanitary matters, the King Institute received constant attention.

No candidates qualified during the year as first or second class Health officers. Forty-one went through successfully the course prescribed for qualified Sanitary Inspectors and Assistant Sanitary Inspectors.

Thirteen Sanitary Inspectors in the employ of local bodies underwent the quinquennial training prescribed in G.O. No. 660 L., dated 21st May 1910, and G.O. No. 1108 L., dated 16th June 1914, and 23 Inspectors qualified as vaccinators.

The checking of stores and the maintenance of service registers of the office establishment have been duly attended to.

OFFICE OF THE SANITARY COMMISSIONER,
MADRAS, 1st October 1920.

E. L. PERRY, Lieut.-Col., I.M.S.,
Sanitary Commissioner, Madras.

APPENDIX.

VITAL STATISTICS OF THE GENERAL POPULATION.

No. L.—Statement showing the Births registered in the districts of the Madras Presidency during the year 1919.

Number	Population (exclusive of Europeans and Eurasians as per census of 1911).		Districts.	Population (exclusive of Europeans and Eurasians) for which returns were received.		Number of births registered (exclusive of Europeans and Eurasians and still-births).		Ratio of births per 1,000 of population.		Mean ratio of births per 1,000 during the previous five years.	
	Males.	Females.		Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.
1	493,045	468,788	Anantapur	493,045	468,788	961,833	12,553	12,658	25,211	13.1	13.5
2	435,007	406,937	Batary	435,007	406,937	841,944	10,406	10,693	21,100	10.6	10.2
3	1,403,210	1,393,210	Chingleput	1,403,210	1,393,210	2,796,420	20,615	19,810	40,425	14.7	14.1
4	1,233,454	1,233,454	Chittoor	1,233,454	1,233,454	2,466,908	14,741	14,366	29,107	11.9	11.6
5	1,024,812	1,071,505	Chennai	1,024,812	1,071,505	2,096,317	28,901	27,179	56,080	13.7	12.6
6	454,027	454,027	Coimbatore	454,027	454,027	908,054	10,230	9,788	20,018	11.4	10.9
7	885,232	1,001,819	Madras	885,232	1,001,819	1,887,051	21,072	19,997	41,069	11.3	10.7
8	1,774,770	1,774,770	Tamil Nadu	1,774,770	1,774,770	3,549,540	41,144	39,994	81,138	11.0	10.7
9	1,044,001	1,178,500	Tamil Nadu	1,044,001	1,178,500	2,222,501	31,109	29,970	61,079	11.2	10.7
10	707,237	737,237	Madras	707,237	737,237	1,444,474	18,611	17,586	36,197	12.9	12.3
11	1,044,001	1,178,500	Madras	1,044,001	1,178,500	2,222,501	31,109	29,970	61,079	11.2	10.7
12	811,786	840,235	Madras	811,786	840,235	1,652,021	20,513	19,488	40,001	12.4	11.9
13	856,645	840,752	Madras	856,645	840,752	1,697,397	20,623	19,445	40,068	13.7	13.5
14	994,862	1,002,452	Madras	994,862	1,002,452	1,997,314	28,370	26,656	55,026	14.2	13.5
15	250,002	245,136	Madras	250,002	245,136	495,138	10,856	10,280	21,136	11.6	11.0
16	245,312	245,136	Madras	245,312	245,136	490,448	9,437	8,967	18,404	11.8	11.4
17	665,011	665,011	Madras	665,011	665,011	1,330,022	16,743	16,433	33,176	15.2	14.6
18	969,645	969,645	Madras	969,645	969,645	1,939,290	24,666	23,545	48,211	15.2	14.6
19	1,019,695	1,019,695	Madras	1,019,695	1,019,695	2,039,390	24,666	23,545	48,211	15.2	14.6
20	1,172,441	1,172,441	Madras	1,172,441	1,172,441	2,344,882	28,370	26,656	55,026	14.2	13.5
21	577,832	577,832	Madras	577,832	577,832	1,155,664	13,449	12,745	26,194	11.8	11.4
22	845,493	845,493	Madras	845,493	845,493	1,690,986	20,666	19,488	40,154	15.2	14.6
23	1,074,678	1,074,678	Madras	1,074,678	1,074,678	2,149,356	28,370	26,656	55,026	14.2	13.5
24	1,044,001	1,178,500	Madras	1,044,001	1,178,500	2,222,501	31,109	29,970	61,079	11.2	10.7
25	511,176	511,176	Madras	511,176	511,176	1,022,352	10,611	10,068	20,679	13.4	13.1
26	23,584,306	21,245,025	Grand Total	23,584,306	21,245,025	44,829,331	437,969	427,969	865,938	17.1	16.2
27	2,384,185	2,490,051	Total of Town circles in the Presidency.	2,384,185	2,490,051	4,874,236	68,981	64,727	133,708	14.2	13.3
28	18,190,021	18,754,976	Total of Rural circles in the Presidency.	18,190,021	18,754,976	39,955,095	437,969	427,969	865,938	17.1	16.2

VITAL STATISTICS OF THE GENERAL POPULATION

Number.	Districts and towns.	Population for which returns were received.	Births.		Total number.	Infant mortality per 1,000 of population.	Deaths.		Injuries.		Total.		All other causes.	Total deaths from all causes.	Earnings of people per 1,000 of population.					Remarks.			
			Males.	Females.			Males.	Females.	Males.	Females.	Males.	Females.			Males.	Females.	Males.	Females.	Males.		Females.	Males.	Females.
41	B. - Town - coal.	17,920	150	183	344	102	37	289	47	70	33	4	103	334	32.4	39.29	For the year.						
42	M.T.C. Erode	19,701	267	346	513	307	21	112	102	86	1	13	239	643	23.6	28.59	For the year.						
43	M.T.C. Erode	10,448	113	142	254	243	1	76	60	38	1	6	167	318	22.8	22.89	For the year.						
44	M.T.C. Erode	9,429	106	155	268	271	5	20	18	1	1	3	146	224	22.4	22.89	For the year.						
45	M.T.C. Erode	18,931	67	57	119	67	37	289	47	70	33	4	103	334	32.4	39.29	For the year.						
46	M.T.C. Erode	12,564	74	59	134	117	17	10	6	1	1	3	146	224	22.4	22.89	For the year.						
47	M.T.C. Erode	10,468	92	89	172	158	17	10	6	1	1	3	146	224	22.4	22.89	For the year.						
48	M.T.C. Erode	10,468	135	161	331	345	47	43	38	1	1	3	146	224	22.4	22.89	For the year.						
49	M.T.C. Erode	8,213	84	59	134	117	17	10	6	1	1	3	146	224	22.4	22.89	For the year.						
50	M.T.C. Erode	8,213	117	83	209	219	17	10	6	1	1	3	146	224	22.4	22.89	For the year.						
51	M.T.C. Erode	5,857	57	55	102	174	17	10	6	1	1	3	146	224	22.4	22.89	For the year.						
52	M.T.C. Erode	17,507	229	231	577	334	29	1	41	90	95	10	575	681	33.4	33.5	For the year.						
53	M.T.C. Erode	15,726	225	183	413	292	217	...	110	6	...	3	194	496	33.8	33.5	For the year.						
54	M.T.C. Erode	15,005	50	30	138	73	10	...	30	...	...	...	42	106	13	33	For the year.						
55	M.T.C. Erode	11,200	70	74	166	129	35	...	43	...	...	...	51	123	23	33	For the year.						
56	M.T.C. Erode	8,052	32	34	176	97	...	...	12	...	...	...	36	114	47	33	For the year.						
57	M.T.C. Erode	6,531	42	21	64	114	...	...	30	...	...	...	26	81	31	33	For the year.						
58	M.T.C. Erode	31,495	361	316	677	315	86	149	318	121	1,1	18	622	1,010	37	33	For the year.						
59	M.T.C. Erode	18,970	231	256	487	255	107	...	312	145	43	...	216	82	18	33	For the year.						
60	M.T.C. Erode	17,832	189	197	389	216	117	36	231	110	...	...	1	128	66	33	For the year.						
61	M.T.C. Erode	9,522	80	67	132	104	31	5	76	14	...	...	22	107	37	33	For the year.						
62	M.T.C. Erode	7,062	102	62	184	249	79	...	76	45	6	...	55	163	16	33	For the year.						
63	M.T.C. Erode	7,062	95	95	190	121	42	...	69	12	5	...	122	200	60	33	For the year.						
64	M.T.C. Erode	6,052	75	50	133	220	57	2	210	17	...	...	27	200	94	33	For the year.						
65	M.T.C. Erode	54,119	716	731	1,447	257	13	201	673	161	212	1	14	822	2,167	63	33	For the year.					
66	M.T.C. Erode	43,417	676	641	1,321	273	0	438	410	54	20	1	3	657	1,611	61	33	For the year.					
67	M.T.C. Erode	15,456	124	125	250	162	31	...	191	62	15	1	3	141	284	22	...	For the year.					
68	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
69	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
70	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
71	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
72	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
73	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
74	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
75	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
76	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
77	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
78	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
79	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
80	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					
81	M.T.C. Erode	15,456	55	39	88	57	10	2	150	17	...	...	...	131	67	61	...	For the year.					

Number.	Districts and towns.	5	Births.		Cholera.		Small-pox.	Plague.	Lepra.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.					12	13	Rate of deaths per 1,000 population.									
			Total number.		Males.	Females.						Suicides.	Wounds and accidents.	Struck by wild beasts.	Rabies.	Total.			All other causes.	Total deaths from all causes.	Cholera.	Small-pox.	Typhus.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	All other causes.	Rate per 1,000 population.
			Males.	Females.																								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22							
B. - Towns - cont.																												
23	Guntur - cont.	8,743	144	261	292	27	139	53	43	22	43	279	26	52	136	32	32	32	32	32	32							
24	M.T.C. Narasapur	13,018	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
25	M.T.C. Chinnai	10,572	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
26	M.T.C. Bapatla	10,572	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
27	M.T.C. Vekkalam	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
28	M.T.C. Mangalagiri	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
29	M.T.C. Penukonda	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
30	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
31	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
32	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
33	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
34	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
35	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
36	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
37	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
38	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
39	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
40	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
41	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
42	M.T.C. Kottur	8,743	161	315	297	48	69	13	78	13	78	467	26	61	32	32	32	32	32	32	32							
43	M.T.C. Kottur	8,743	161	315	297	48	69	13	78																			

44. Births and Deaths registered from Different Quarters in the districts and towns of the Madras Presidency during the year 1919-20.

Number.	Districts and towns.	Births.			Injuries.					Ratio of deaths per 1,000 of population.									
		Popula- tion for which returns were received.	Total number.		And	Suicides.	Wounds and accidents.		Killed by wild beasts.	Total.	Total deaths from all causes.	Ratio of deaths per 1,000 of population.							
			Male.	Female.			Cholera.	Small-pox.				Plague.	Typhus.	Dysentery and diarrhoea.	Respiratory diseases.	All other causes.	From all causes.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
118	Mudanya-coast.	5,723	114	55	109	500	34	...	...	...	...	179	14	...	19	...	...	...	...
119	T.C. Akko.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
120	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
121	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
122	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
123	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
124	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
125	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
126	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
127	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
128	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
129	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
130	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
131	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
132	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
133	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
134	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
135	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
136	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
137	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
138	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
139	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
140	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
141	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
142	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
143	T.C. Erzurum.	1,000	100	50	100	500	34	...	...	...	...	179	14	...	19	...	...	...	...
144	T.C. Erzurum.	1,000	100	50	100	500</													

No. VI.—Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1919—cont.

Number	Districts and towns.	Population for whom returns were received.	Births.		Deaths.	Injuries.		Respiratory diseases.	Dysentery and diarrhoea.	Typhoid.	Scarlet fever.	Cholera.	Total deaths from all causes.		Ratio of deaths per 1,000 of population to—					
			Males.	Females.		Males.	Females.								Cholera.	Scarlet fever.	Plague.	Pneumonia.	Other causes.	For the year.
151	North Arcot—cont.	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
152	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
153	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
154	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
155	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
156	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
157	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
158	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
159	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
160	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
161	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
162	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
163	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
164	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
165	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
166	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
167	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
168	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
169	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
170	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
171	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
172	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
173	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
174	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
175	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
176	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
177	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
178	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
179	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
180	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
181	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
182	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
183	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
184	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
185	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
186	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
187	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
188	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
189	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
190	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
191	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
192	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
193	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
194	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
195	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
196	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178
197	T.C. Andhra	6,478	30	49	67	5	10	8	3	3	1	1	10	27	10	1	1	1	1	178

No. VI.—Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1919—cont.

Number	Districts and towns.	Births.		Deaths.	Cholera.	Small-pox.	Plague.	Erysipelas.	Dysentery and diarrhoea.	Injuries.		Total deaths from all causes.	Ratio of deaths per 1,000 of population.						Mean for the year.				
		Males.	Females.							Wounds and lacerations.	Struck by falling objects.		Burns.	Scalds.	Fractures.	Cholera.	Small-pox.	Plague.		Pneumonia.	Respiratory diseases.	Other causes.	
198	North Arcot—cont.	781	718	1,500	310	534	11	108	106	140	1	36	1,007	1.07	1.37	1.07	1.37	1.07	1.37	1.07	1.37	1.07	1.37
199	M.T.C. Mangalore	10,871	10,871	21,742	20	77	1	10	10	10	1	1	21,742	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
200	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
201	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
202	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
203	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
204	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
205	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
206	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
207	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
208	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
209	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
210	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
211	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
212	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
213	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
214	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
215	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
216	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
217	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
218	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
219	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
220	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
221	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
222	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
223	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
224	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
225	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
226	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
227	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
228	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
229	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
230	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
231	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
232	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
233	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
234	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
235	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
236	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
237	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
238	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
239	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
240	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
241	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
242	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
243	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
244	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
245	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
246	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
247	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
248	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
249	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
250	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
251	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
252	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
253	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
254	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
255	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
256	T.C. Kanyakumari	6,478	6,478	12,956	31	11	1	1	1	1	1	1	12,956	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
257	T.C.																						

Vol. VI.—Births and Deaths registered from Different Quarters in the Districts and Towns of the Alaska Presidency during the year 1919—cont.

[illegible]

No. VII.—Deaths registered from Cholera in the districts of the Madras Presidency during each month of the year 1919.

1	2	3	4	5	6	7	8															
Number	Districts.	Circles of registration	Villages.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.	Mean ratio per 1,000 for previous 5 years.	
			Number in each district.	Number from which deaths were reported.													Males.	Females.	Total.			
1	Anantapur	22	848	133	26	1	1	14	10	73	313	231	49	30	14	...	...	456	915	10	10	20
2	Bellary	20	940	10	...	...	...	...	...	...	...	...	...	...	...	...	...	12	57	0.03	0.1	2.0
3	Chingleput	20	2,167	1,189	892	108	1	14	592	602	19	302	91	79	17	61	...	2,402	4,038	3.2	3.4	3.4
4	Chittoor	14	2,347	1,310	517	374	...	173	324	240	218	244	91	60	163	430	...	2,637	4,897	4.2	2.6	1.7
5	Coimbatore	22	1,350	1,183	145	18	49	173	85	134	375	481	13	68	202	701	...	1,318	2,478	1.1	1.2	1.2
6	Cuddapah	17	882	761	1,022	38	...	...	65	134	375	481	314	179	100	91	...	1,807	3,500	4.1	3.8	2.8
7	Ganjam Plains	18	4,154	200	428	591	...	979	2,191	2,170	1,791	752	389	303	330	277	...	5,304	10,434	3.1	3.1	6.0
8	Do. Agency	1	52	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2	0.5	0.2	0.6
9	Total	19	4,206	638	428	591	...	979	2,191	2,170	1,791	752	389	303	330	277	...	5,306	10,439	6.1	6.1	6.6
10	Gadagur Plains	17	883	127	10	21	1	1	4	11	586	47	62	82	...	7	...	882	1,668	1.2	1.1	1.9
11	Do. Agency	5	1,192	36	...	...	...	...	...	...	...	...	...	...	...	5	...	109	186	1.0	0.8	0.9
12	Total	22	1,035	163	10	21	1	1	4	11	586	745	252	183	55	12	...	941	1,861	1.2	1.1	1.9
13	Guntur	21	945	150	74	85	10	10	17	173	152	71	23	151	263	114	...	314	1,163	0.7	0.7	1.6
14	Kistna	25	1,715	134	111	65	84	81	31	87	221	146	16	4	1	1	...	352	1,093	0.6	0.4	0.5
15	Kurnool	12	503	115	256	51	4	3	105	10	18	73	13	8	...	25	...	419	791	0.9	0.6	0.9
16	Kurnool	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	205	325	1.2	1.3	1.3
17	Kurnool	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,430	2,663	1.5	1.3	1.4
18	Kurnool	10	1,108	259	1,453	463	107	18	47	3	3	3	27	89	91	395	...	6,483	8,433	4.4	5.5	5.0
19	Kurnool	18	2,213	768	2,074	703	697	724	1,052	2,387	2,483	2,314	1,045	292	132	375	...	1,690	2,584	2.2	2.1	0.2
20	Kurnool	21	1,892	486	1,347	793	81	43	9	6	14	65	20	21	11	2	...	13	18	0.3	0.1	0.2
21	Nellore	6	57	5	...	...	...	...	...	...	...	...	...	...	...	...	...	8,302	6,158	3.4	2.9	3.1
22	Nellore	20	3,225	1,214	835	704	486	872	872	1,008	573	479	102	54	89	92	...	878	1,023	1.3	0.9	1.0
23	North Arcot	21	3,408	1,322	418	395	52	54	34	7	11	203	136	97	604	855	...	745	8,215	2.7	2.4	2.6
24	Ramanad	17	2,562	438	1,080	365	61	61	164	725	671	107	107	100	349	1,182	...	4,411	3,958	1.4	1.3	1.3
25	Salem	16	2,351	403	387	431	225	...	30	54	7	87	42	782	591	316	...	4,486	8,854	7.0	7.3	7.1
26	South Arcot	13	11	805	287	451	111	8	19	715	1,456	801	1,023	782	308	1,543	...	1,929	3,623	1.7	1.4	1.5
27	South Arcot	30	2,527	560	681	38	59	10	22	25	108	321	321	135	303	727	...	1,740	3,812	2.4	1.9	1.9
28	Tanjore	35	1,168	365	1,871	437	97	81	53	18	12	28	90	135	197	1,031	...	1,272	2,348	1.5	1.1	1.3
29	Tinnevely	15	1,074	330	371	87	62	13	13	465	925	1,089	79	141	251	100	...	5,166	6,905	3.0	2.6	0.4
30	Trichinopoly	22	2,609	237	1,186	623	...	76	183	465	925	1,089	247	249	251	100	...	2,689	5,905	2.0	2.3	2.3
31	Visagapatnam Plains	455	42,052	8,289	21,245	4,716	3,023	8,614	6,636	8,614	10,564	9,362	4,531	6,765	4,261	8,763	...	47,401	93,292	2.4	2.3	1.5
32	Total, Madras Presidency	455	42,052	8,289	21,245	4,716	3,023	8,614	6,636	8,614	10,564	9,362	4,531	6,765	4,261	8,763	...	47,401	93,292	2.4	2.3	1.5

No. X.—Deaths registered from Dysentery and Diarrhoea in the districts of the Madras Presidency during each month of the year 1919.

36

APPENDIX

Number.	Districts.	Circles of registration.	Number in each district.	Number from which dysentery and diarrhoea were reported.	Months.												Total.	Ratio of deaths per 1,000 of population.	Mean ratio per 1,000 for previous 5 years.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Anantapur	22	846	163	90	49	62	63	41	49	72	60	34	61	49	45	302	0.7	1.1
2	Bellary	20	949	131	129	75	91	97	95	105	150	154	105	113	81	83	694	1.3	2.1
3	Chingleput	20	2,157	860	742	595	435	257	310	354	323	281	295	242	346	386	2,373	3.2	2.9
4	Chittoor	14	2,417	1,873	292	145	129	162	168	180	191	138	130	80	129	145	950	1.5	1.6
5	Coimbatore	22	1,350	633	431	425	417	359	324	326	335	416	308	354	516	553	2,640	2.5	3.0
6	Cuddapah	17	882	275	50	58	40	27	55	21	47	81	60	64	43	31	306	0.7	0.8
7	Ganjam Plains	18	4,154	780	149	140	147	257	204	230	406	405	242	247	101	163	1,351	1.8	1.1
8	Godavari Plains	10	4,206	788	153	146	147	257	205	303	471	480	212	247	101	153	1,354	1.8	1.1
9	Guntur	21	945	331	87	92	93	71	76	113	120	124	107	82	138	181	693	0.9	1.0
10	Kistna	23	1,715	826	138	77	89	76	77	115	120	103	148	111	100	98	687	0.7	0.7
11	Kurnoor	12	1,805	1,098	51	21	21	32	26	23	65	82	46	36	20	31	281	0.5	0.5
12	Madras	19	1,108	339	491	298	426	377	353	427	472	607	306	214	462	555	2,898	1.9	1.4
13	Madurai	18	2,213	693	1,095	878	905	1,034	1,184	1,113	1,142	1,132	204	174	249	430	1,337	1.4	1.4
14	Malabar	21	1,602	556	108	81	50	32	30	82	24	37	80	40	43	53	310	0.5	0.4
15	Nilgiris, &c.	6	2,326	919	754	519	348	266	355	337	58	51	34	56	50	34	304	0.5	0.4
16	North Arcot	23	3,405	1,011	192	129	85	63	85	72	79	102	162	137	143	215	2,326	0.5	0.4
17	North Arcot	31	2,569	478	799	171	148	106	166	227	201	169	129	195	294	250	1,198	0.9	0.8
18	Ramanud	17	2,331	361	361	336	266	214	224	415	247	67	159	238	265	402	1,694	1.2	1.2
19	South Arcot	19	1,859	548	461	376	266	174	135	336	732	727	715	627	451	521	2,812	1.4	1.3
20	South Arcot	11	2,527	511	353	220	162	118	127	137	142	186	177	180	240	309	1,765	1.1	1.0
21	Tanjore	30	1,168	433	433	224	169	103	102	137	142	186	177	180	240	309	1,765	1.1	1.0
22	Tinnevely	15	1,074	433	239	166	135	102	103	117	250	114	101	137	201	364	1,126	1.3	1.3
23	Tondiarpet	15	2,509	218	101	159	130	110	139	107	215	237	182	145	116	131	861	0.9	0.7
24	Vizagapatnam Plains	23	420.2	14.047	8,405	5,509	4,821	4,357	6,334	6,423	7,958	7,886	5,774	5,054	5,380	7,103	37,679	1.9	1.7
25	Total Madras Presidency	495	42,052	14,047	8,405	5,509	4,821	4,357	6,334	6,423	7,958	7,886	5,774	5,054	5,380	7,103	37,679	1.9	1.7

VITAL STATISTICS OF THE GENERAL POPULATION

37

No. XI.—Deaths registered from Respiratory Diseases in the districts of the Madras Presidency during each month of the year 1919.

Number.	Districts.	Circles of registration.	Number in each district.	Number from which respiratory diseases were reported.	Months.												Total.	Ratio of deaths per 1,000 of population.	Mean ratio per 1,000 for previous 5 years.
					January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
1	Anantapur	22	846	202	150	112	106	89	89	96	89	110	91	106	111	132	725	1.5	1.3
2	Bellary	20	949	106	114	82	100	80	120	105	87	63	63	62	82	99	539	1.3	1.1
3	Chingleput	20	2,157	344	133	212	159	156	148	156	126	140	129	138	169	162	1,033	1.5	1.4
4	Chittoor	14	2,417	1,691	313	60	102	145	145	86	143	186	152	178	172	240	921	1.6	1.4
5	Coimbatore	22	1,350	580	320	232	227	236	223	232	140	237	230	242	328	347	1,439	1.6	1.5
6	Cuddapah	17	882	413	51	43	57	50	68	52	62	52	63	64	76	33	413	0.9	0.8
7	Ganjam Plains	18	4,154	203	70	54	62	56	70	71	92	74	39	33	34	32	315	0.4	0.3
8	Godavari Plains	10	4,206	205	70	54	62	56	70	71	92	74	39	33	34	32	315	0.4	0.3
9	Guntur	21	945	532	249	179	173	187	220	203	245	250	200	332	293	315	1,796	1.2	1.2
10	Kistna	23	1,715	605	499	363	331	317	416	500	597	629	585	652	695	621	3,296	1.9	1.7
11	Kurnoor	12	1,805	1,098	51	21	21	32	26	23	65	82	46	36	20	31	281	0.5	0.5
12	Madras	19	1,108	339	491	298	426	377	353	427	472	607	306	214	462	555	2,898	1.9	1.4
13	Madurai	21	1,602	556	108	81	50	32	30	82	24	37	80	40	43	53	310	0.5	0.4
14	Malabar	23	2,326	919	754	519	348	266	355	337	58	51	34	56	50	34	304	0.5	0.4
15	Nilgiris, &c.	6	2,326	919	754	519	348	266	355	337	58	51	34	56	50	34	304	0.5	0.4
16	North Arcot	31	2,569	478	799	171	148	106	166	227	201	169	129	195	294	250	1,198	0.9	0.8
17	North Arcot	17	2,331	361	361	336	266	214	224	415	247	67	159	238	265	402	1,694	1.2	1.2
18	Ramanud	19	1,859	548	461	376	266	174	135	336	732	727	715	627	451	521	2,812	1.4	1.3
19	South Arcot	11	2,527	511	353	220	162	118	127	137	142	186	177	180	240	309	1,765	1.1	1.0
20	South Arcot	30	1,168	433	224	169	103	102	103	117	250	114	101	137	201	364	1,126	1.3	1.3
21	Tanjore	15	1,074	433	239	166	135	102	103	117	250	114	101	137	201	364	1,126	1.3	1.3
22	Tinnevely	15	2,509	218	101	159	130	110	139	107	215	237	182	145	116	131	861	0.9	0.7
23	Tondiarpet	23	420.2	14.047	8,405	5,509	4,821	4,357	6,334	6,423	7,958	7,886	5,774	5,054	5,380	7,103	37,679	1.9	1.7
24	Vizagapatnam Plains	23	42,052	14,047	8,405	5,509	4,821	4,357	6,334	6,423	7,958	7,886	5,774	5,054	5,380	7,103	37,679	1.9	1.7
25	Total Madras Presidency	495	42,052	14,047	8,405	5,509	4,821	4,357	6,334	6,423	7,958	7,886	5,774	5,054	5,380	7,103	37,679	1.9	1.7

No. XII.—Deaths registered from Plague in the districts of the Madras Presidency during each month of the year 1919.

Number.	Districts.	3		4		5												6		7		8		
		Circles of registration.		Villages.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.		Ratio of deaths per 1,000 of population.				
		Number in each district.	Number from which deaths were reported.	Number in each district.	Number from which deaths were reported.													Males.	Females.		Total.		Males.	Females.
1	Anantapur	22	12	816	23	81	30	2	2	..	..	..	2	..	..	..	3	21	81	80	141	0.2	0.1	0.1
2	Bellary	20	13	949	39	269	137	45	16	5	20	84	125	225	190	165	252	252	778	801	1,578	1.6	1.7	1.6
3	Chingleput	20	6	2,157	6	21	7	..	..	..	18	..	..	..	..	..	..	..	9	10	19	0.01	0.01	0.03
4	Chittoor	14	6	2,447	6	372	269	169	6	..	22	98	115	167	148	84	270	..	20	8	28	0.03	0.01	0.02
5	Cumbhure	22	1	1,350	1	13	24	4	..	..	..	..	..	..	..	..	..	..	778	820	1,598	0.7	0.8	0.7
6	Cuddapah	17	1	832	1	13	21	..	..	..	..	..	..	..	..	..	..	..	23	18	41	0.03	0.04	0.03
7	Ganjum Plains	18	..	4,154	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Do. Agency	1	..	51	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	Total	19	..	4,203	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1,001	..	..
	Gadswari Plains	17	1	833	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	Do. Agency	5	..	1,102	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total	22	1	1,935	1	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	1,001	..	..
10	Guntur	21	12	945	25	169	179	72	22	8	..	3	..	..	..	..	..	14	239	225	464	0.3	0.3	0.04
11	Kistna	26	1	1,715	1	65	53	10	2	..	4	..	..	..	1	..	..	..	7	14	21	0.01	0.01	0.01
12	Kurrukel	12	6	500	11	8	5	5	..	..	..	..	..	..	..	..	..	..	58	54	112	0.1	0.1	0.5
13	Madure	19	1	1,108	1	28	21	3	..	..	..	21	31	49	56	154	352	..	8	6	14	0.03	0.02	0.03
14	Madure	18	1	2,213	9	28	21	3	..	3	..	..	..	..	..	..	..	..	290	375	665	0.3	0.4	0.3
15	Nellore	21	4	2,826	8	3	3	4	..	..	..	..	20	9	..	5	..	..	58	34	92	0.04	0.02	0.05
16	Nilgiris, Tho	29	16	3,408	68	192	134	79	8	9	3	..	..	..	3	9	..	..	13	11	24	0.2	0.2	0.01
17	North Arcot	31	1	2,851	49	116	83	42	12	4	..	..	2	..	..	..	..	..	218	229	447	0.2	0.2	0.01
18	Ramanad	17	10	2,851	49	116	83	42	12	4	..	..	27	6	4	..	..	..	1	1	2	0.001	0.001	0.001
19	Salom	19	1	2,851	49	116	83	42	12	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
20	South Arcot	11	1	2,851	49	116	83	42	12	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
21	South Kanara	30	2	2,851	49	116	83	42	12	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..
22	Tanjore	35	1	1,169	1	35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
23	Tinnevely	15	3	1,074	3	35	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
24	Vishnupuram	25	..	2,550	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
25	Vizagapatnam	25	..	2,550	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total, Madras Presidency	405	120	42,052	363	1,967	1,447	373	68	30	75	219	326	466	401	459	920	2,576	5,658	2,739	2,876	5,615	0.1	0.1	0.3

No. XIII.—Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.

(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

1 Name of municipality.	2 Date of completion of works of	3 Average annual death-rate since the introduction of drainage system or water-supply.				4 Percentage of deaths to total mortality under each head of death causation.				5 Average annual death-rate for the five-year period preceding the introduction of drainage system or water-supply.		6 Percentage of deaths to total mortality under each head of death causation.			
		Years.	Death-rate.	Cholera.	Small-pox.	Fever.	Dysentery and diarrhoea.	All other causes.	Years.	Death-rate.	Cholera.	Small-pox.	Fever.	Dysentery and diarrhoea.	All other causes.
Adul	1895	1895	23.6	0.3	0.1	38.1	0.3	0.3	1890	19.2	...	...	...	...	...
		1896	25.4	1.0	0.9	31.2	0.9	0.8	1891	38.1	...	...	...	...	...
		1897	37.9	0.3	0.3	29.7	5.3	5.3	1892	34.7	...	...	...	...	...
		1898	26.5	...	...	22.1	2.4	2.4	1893	22.2	...	...	...	...	...
		1899	24.1	...	...	34.9	5.3	5.3	1894	24.3	...	...	...	...	...
		1900	23.4	...	...	30.0	2.9	2.9	...	...	...	...	...	...	...
		1901	20.1	...	...	2.4	0.9	0.9	...	...	...	...	...	...	...
		1902	56.5	...	...	6.0	10.9	8.5	...	...	...	...	...	...	...
		1903	23.1	...	...	2.8	2.6	2.6	...	...	...	...	...	...	...
		1904	71.3	...	...	5.7	11.3	6.5	...	...	...	...	...	...	...
		1905	31.1	...	...	5.1	10.8	0.3	...	...	...	...	...	...	...
		1906	39.8	...	...	3.8	13.2	8.1	...	...	...	...	...	...	...
		1907	24.2	...	...	1.2	10.4	7.1	...	...	...	...	...	...	...
		1908	26.3	...	...	1.9	13.5	7.1	...	...	...	...	...	...	...
		1909	25.5	...	...	0.3	9.5	8.6	...	...	...	...	...	...	...
Barhampur	1895	1910	30.1	...	...	0.4	8.9	8.9	...	...	...	...	...	...	...
		1911	23.6	...	...	1.6	12.7	10.6	...	...	...	...	...	...	...
		1912	33.8	...	...	4.6	11.6	8.3	...	...	...	...	...	...	...
		1913	22.4	...	...	23.3	6.4	6.0	...	...	...	...	...	...	...
		1914	55.2	...	...	8.7	8.0	8.1	...	...	...	...	...	...	...
		1915	29.3	...	...	12.5	10.5	7.6	...	...	...	...	...	...	...
		1916	25.7	...	...	7.9	3.0	8.9	...	...	...	...	...	...	...
		1917	67.9	...	...	7.2	1.4	2.4	...	...	...	...	...	...	...
		1918	59.5	...	...	3.2	3.7	4.5	...	...	...	...	...	...	...
		1919	10.3	...	...	10.4	25.7	50.2	...	...	...	...	...	...	...
		1920	28.6	...	...	2.4	24.0	57.2	...	...	...	...	...	...	...
		1921	29.1	...	...	2.4	21.3	55.2	...	...	...	...	...	...	...
		1922	24.0	...	...	2.4	21.3	55.2	...	...	...	...	...	...	...
		1923	26.6	...	...	2.4	21.3	55.2	...	...	...	...	...	...	...
		1924	37.5	...	...	0.7	38.4	45.8	...	...	...	...	...	...	...
Barrida	1895	1919	41.9	...	...	11.3	24.1	48.9	...	...	...	...	...	...	...
		1920	38.7	...	...	1.7	11.9	7.5	...	...	...	...	...	...	...
		1921	42.6	...	...	0.1	13.4	6.9	...	...	...	...	...	...	...
		1922	30.5	...	...	0.8	13.7	7.7	...	...	...	...	...	...	...
		1923	30.4	...	...	1.0	11.3	6.6	...	...	...	...	...	...	...
		1924	26.1	...	...	...	10.3	7.4	...	...	...	...	...	...	...
		1925	37.0	...	...	3.1	12.9	7.8	...	...	...	...	...	...	...
		1926	37.4	...	...	0.7	12.5	7.8	...	...	...	...	...	...	...
		1927	33.5	...	...	4.7	12.6	7.3	...	...	...	...	...	...	...
		1928	...	...	...	...	...	...	...	...	...	...	...	...	...
		1929	...	...	...	...	...	...	...	...	...	...	...	...	...
		1930	...	...	...	...	...	...	...	...	...	...	...	...	...
		1931	...	...	...	...	...	...	...	...	...	...	...	...	...
		1932	...	...	...	...	...	...	...	...	...	...	...	...	...
		1933	...	...	...	...	...	...	...	...	...	...	...	...	...

Chidambaram	1895	1917	48.2	3.7	0.1	11.5	8.5	78.2	1910	49.2	...	...	...	...	...
		1918	67.6	2.9	0.1	17.5	6.5	64.7	1911	40.0	...	...	...	...	...
		1919	63.8	2.0	0.6	17.5	6.5	64.7	1912	37.6	...	...	...	...	...
		1920	...	...	...	...	...	...	1913	38.6	...	...	...	...	...
		1921	...	...	...	...	...	...	1914	36.4	...	...	...	...	...
		1922	...	...	...	...	...	...	...	...	...	...	...	...	...
		1923	...	...	...	...	...	...	...	...	...	...	...	...	...
		1924	...	...	...	...	...	...	...	...	...	...	...	...	...
		1925	...	...	...	...	...	...	...	...	...	...	...	...	...
		1926	...	...	...	...	...	...	...	...	...	...	...	...	...
		1927	...	...	...	...	...	...	...	...	...	...	...	...	...
		1928	...	...	...	...	...	...	...	...	...	...	...	...	...
		1929	...	...	...	...	...	...	...	...	...	...	...	...	...
		1930	...	...	...	...	...	...	...	...	...	...	...	...	...
		1931	...	...	...	...	...	...	...	...	...	...	...	...	...
Coimbatore	1895	1917	48.2	3.7	0.1	11.5	8.5	78.2	1910	49.2	...	...	...	...	...
		1918	67.6	2.9	0.1	17.5	6.5	64.7	1911	40.0	...	...	...	...	...
		1919	63.8	2.0	0.6	17.5	6.5	64.7	1912	37.6	...	...	...	...	...
		1920	...	...	...	...	...	...	1913	38.6	...	...	...	...	...
		1921	...	...	...	...	...	...	1914	36.4	...	...	...	...	...
		1922	...	...	...	...	...	...	...	...	...	...	...	...	...
		1923	...	...	...	...	...	...	...	...	...	...	...	...	...
		1924	...	...	...	...	...	...	...	...	...	...	...	...	...
		1925	...	...	...	...	...	...	...	...	...	...	...	...	...
		1926	...	...	...	...	...	...	...	...	...	...	...	...	...
		1927	...	...	...	...	...	...	...	...	...	...	...	...	...
		1928	...	...	...	...	...	...	...	...	...	...	...	...	...
		1929	...	...	...	...	...	...	...	...	...	...	...	...	...
		1930	...	...	...	...	...	...	...	...	...	...	...	...	...
		1931	...	...	...	...	...	...	...	...	...	...	...	...	...

(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

1	2	3	4				5	6										
Name of municipality.	Date of completion of works of		Average annual death-rate since the introduction of drainage system or water-supply.		Percentage of deaths to total mortality under each head of death causation.				Average annual death-rate for the five-year period preceding the introduction of drainage system or water-supply.				Percentage of deaths to total mortality under each head of death causation.					
	Drainage.	Water-supply.	Years.	Death-rate.	Cholera.	Small-pox.	Fevers.	Dysentery and diarrhoea.	All other causes.	Years.	Death-rate.	Cholera.	Small-pox.	Dysentery and diarrhoea.	All other causes.			
Coonor-cont.	...	1893	1902	29.0	...	...	...	15.1	19.0	65.9	...	...	...	...	...	...		
			1903	45.9	...	...	...	...	...	...	...	...	...	...	...	...	...	
			1904	27.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1905	37.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1906	41.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1907	31.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1908	20.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1909	32.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1910	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1911	31.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1912	26.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1913	30.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1914	28.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1915	21.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1916	23.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1917	32.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1918	46.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oudupah	...	1893	1902	29.0	...	...	...	...	...	...	...	...	...	...	...	...		
			1903	45.9	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1904	27.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1905	37.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1906	41.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1907	31.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1908	20.8	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1909	32.5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1910	39.0	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1911	31.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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			1915	21.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1916	23.7	...	...	...	...	...	...	...	...	...	...	...	...	...	...
			1917	32.4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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VITAL STATISTICS OF THE GENERAL POPULATION										43
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(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

1 Name of municipality.	2 Date of completion of works of		3 Average annual death-rate since the introduction of drainage system or water-supply.		4 Percentage of deaths to total mortality under each head of death causation.				5 Average annual death-rate for the five-year period preceding the intro- duction of drainage system or water- supply.		6 Percentage of deaths to total mortality under each head of death causation.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	Drainage.	Water- supply.	Years.	Death-rate.	Cholera.	Small-pox.	Fever.	Dysentery and diar- rhoea.	All other causes.	Years.	Death-rate.	Cholera.	Small-pox.	Fever.	Dysentery and diar- rhoea.	All other causes.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Karnool	1897	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
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(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation...)

[illegible]

Negapatam	1914	260	100	25	24	235	646	..	304	44	01	182	101	672
	1915	295	99	28	47	164	742	1909	304	168	11	182	101	672
	1916	272	34	20	71	116	759	1910	431	188	21	182	101	672
	1917	214	21	31	89	102	707	1911	332	6	08	180	159	622
	1918	371	13	86	209	110	373	1912	302	47	085	180	159	622
	1919	332	31	32	193	122	632	1913	342	..	..	..	..	..
	1920	261	59	02	471	99	362	1914	..	..	..	..	..	..
	1921	233	..	31	451	29	483	1915	..	..	..	..	..	..
	1922	254	..	100	398	73	410	1916	..	..	..	..	..	..
	1923	327	..	559	..	61	476	1917	..	..	..	..	..	..
Nellore	1914	324	15	03	483	66	476	1906	380	200	84	354	119	355
	1915	337	04	..	161	59	716	1907	374	192	09	..	..	..
	1916	406	16	21	141	79	744	..	..	..	..	..	..	..
	1917	264	21	22	176	61	790	..	..	..	..	..	..	..
	1918	391	04	01	32	54	849	..	..	..	..	..	..	..
	1919	638	01	22	162	70	745	..	..	..	..	..	..	..
	1920	638	178	30	453	45	453	..	..	..	..	..	..	..
	1921	375	59	03	145	75	713	..	..	..	..	..	..	..
	1922	296	..	05	162	103	730	1895	535	..	..	..	..	..
	1923	230	..	..	202	92	685	1896	321	11	..	390	90	520
Ootacamund	1901	231	..	02	112	117	753	1896	..	..	..	..	..	..
	1902	379	..	..	58	100	896	1897	301	..	..	..	..	..
	1903	379	..	..	24	125	851	1898	350	..	03	..	..	..
	1904	315	..	..	44	120	886	1899	261	..	..	..	..	..
	1905	318	..	02	28	121	836	..	..	..	..	..	..	..
	1906	354	..	03	39	152	808	..	..	..	..	..	..	..
	1907	296	..	..	57	103	832	..	..	..	..	..	..	..
	1908	313	..	..	33	113	852	..	..	..	..	..	..	..
	1909	358	..	02	27	153	805	..	..	..	..	..	..	..
	1910	294	..	..	24	120	850	..	..	..	..	..	..	..
Periyakulam	1901	262	..	08	11	118	882	..	..	..	..	..	..	..
	1902	237	..	09	29	120	854	..	..	..	..	..	..	..
	1903	291	..	..	44	147	807	..	..	..	..	..	..	..
	1904	324	..	..	36	106	855	..	..	..	..	..	..	..
	1905	307	..	03	65	125	808	..	..	..	..	..	..	..
	1906	272	..	..	12	132	767	..	..	..	..	..	..	..
	1907	306	..	02	38	192	644	..	..	..	..	..	..	..
	1908	408	..	32	230	89	610	..	..	..	..	..	..	..
	1909	408	..	02	155	271	389	1902	248	16	..	..	..	..
	1910	320	..	..	271	205	516	1903	319	155	..	..	..	..
Salem	1901	295	..	08	240	219	529	1904	312	32	..	..	..	..
	1902	452	..	05	153	255	339	1905	313	..	02	..	..	..
	1903	294	..	..	176	290	547	1906	529	314	03	..	..	..
	1904	310	..	07	134	312	595	..	..	..	..	..	..	..
	1905	312	..	02	206	282	595	..	..	..	..	..	..	..
	1906	336	..	10	212	226	480	..	..	..	..	..	..	..
	1907	313	..	06	218	310	503	..	..	..	..	..	..	..
	1908	295	..	11	201	166	382	..	..	..	..	..	..	..
	1909	430	..	13	444	155	382	..	..	..	..	..	..	..
	1910	393	..	04	225	162	453	..	..	..	..	..	..	..
Tanjore	1901	314	..	06	108	169	717	..	..	..	..	..	..	..
	1902	314	..	06	108	169	717	..	..	..	..	..	..	..
	1903	420	..	04	28	132	530	1909	346	188	07	..	..	..
	1904	446	..	06	115	102	749	1910	326	28	..	..	..	..
	1905	562	..	28	27	110	771	1911	410	161	04	..	..	..
	1906	562	..	70	28	110	771	1912	339	18	..	..	..	..
	1907	545	..	14	276	79	570	1913	321	01	01	..	..	..
	1908	360	..	36	162	83	607	1914	..	..	..	..	..	..
	1909	295	..	03	212	501	501	1915	382	111	03	..	..	..
	1910	270	..	20	235	254	453	1916	394	89	44	..	..	..

(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

1	2	3			4			5			6			
		Date of completion of works of		Average annual death-rate since the introduction of drainage system or water-supply.	Percentage of deaths to total mortality under each head of death causation.		Average annual death-rate for the five-year period preceding the introduction of drainage system or water-supply.	Percentage of deaths to total mortality under each head of death causation.		All other causes.	Dysentery and diarrhoea.	Fever.	Small-pox.	Cholera.
		Drainage.	Water-supply.	Years.	Cholera.	Small-pox.	Years.	Cholera.	Small-pox.					
Tanjore—cont.	...	...	...	1899	4.8	2.5	1899	10.8	50.7	...	...	...	...	...
				1900	5.2	0.1	1900	25.7	50.8	...	...	...	...	...
				1901	3.2	0.6	1901	18.2	50.8	...	...	...	...	...
				1902	3.5	0.1	1902	18.0	50.8	...	...	...	...	...
				1903	29.2	0.1	1903	10.0	50.8	...	...	...	...	...
				1904	29.1	0.1	1904	10.0	50.8	...	...	...	...	...
				1905	30.3	0.1	1905	10.0	50.8	...	...	...	...	...
				1906	30.3	0.1	1906	10.0	50.8	...	...	...	...	...
				1907	35.1	0.1	1907	10.0	50.8	...	...	...	...	...
				1908	35.1	0.1	1908	10.0	50.8	...	...	...	...	...
				1909	35.1	0.1	1909	10.0	50.8	...	...	...	...	...
				1910	35.1	0.1	1910	10.0	50.8	...	...	...	...	...
				1911	35.1	0.1	1911	10.0	50.8	...	...	...	...	...
				1912	35.1	0.1	1912	10.0	50.8	...	...	...	...	...
				1913	35.1	0.1	1913	10.0	50.8	...	...	...	...	...
				1914	35.1	0.1	1914	10.0	50.8	...	...	...	...	...
				1915	35.1	0.1	1915	10.0	50.8	...	...	...	...	...
				1916	35.1	0.1	1916	10.0	50.8	...	...	...	...	...
Tirupadi	...	...	...	1899	4.8	2.5	1899	10.8	50.7	...	...	...	...	...
				1900	5.2	0.1	1900	25.7	50.8	...	...	...	...	...
				1901	3.2	0.6	1901	18.2	50.8	...	...	...	...	...
				1902	3.5	0.1	1902	18.0	50.8	...	...	...	...	...
				1903	29.2	0.1	1903	10.0	50.8	...	...	...	...	...
				1904	29.1	0.1	1904	10.0	50.8	...	...	...	...	...
				1905	30.3	0.1	1905	10.0	50.8	...	...	...	...	...
				1906	30.3	0.1	1906	10.0	50.8	...	...	...	...	...
				1907	35.1	0.1	1907	10.0	50.8	...	...	...	...	...
				1908	35.1	0.1	1908	10.0	50.8	...	...	...	...	...
				1909	35.1	0.1	1909	10.0	50.8	...	...	...	...	...
				1910	35.1	0.1	1910	10.0	50.8	...	...	...	...	...
				1911	35.1	0.1	1911	10.0	50.8	...	...	...	...	...
				1912	35.1	0.1	1912	10.0	50.8	...	...	...	...	...
				1913	35.1	0.1	1913	10.0	50.8	...	...	...	...	...
				1914	35.1	0.1	1914	10.0	50.8	...	...	...	...	...
				1915	35.1	0.1	1915	10.0	50.8	...	...	...	...	...
				1916	35.1	0.1	1916	10.0	50.8	...	...	...	...	...

1919	395	5.5	37	156	189	586	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...</
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27

THE
THIRTIETH ANNUAL REPORT
OF THE
SANITARY ENGINEER TO THE GOVERNMENT OF MADRAS
1919.

This report is for the calendar year 1919 under G.O. No. 944 L., dated 4th June 1913.

2. During the year, there were 29 municipalities mentioned below with protected water-supply systems in operation against 27 of the previous year, and one underground drainage system as before.

These works were frequently inspected by the Sanitary Engineer, the Deputy and Assistant Sanitary Engineers and the Boiler Inspecting staff and the defects observed in the working of the systems and of the pumping machinery, etc., connected therewith were pointed out to the Municipal Councils concerned by means of inspection notes containing the requisite instructions towards remedying the defects thus observed. It was also a satisfactory feature that the persistent emphasis laid by the Sanitary Engineer in the course of the year on the necessity for promptness on the part of Municipal Councils in the submission of their replies to the above mentioned inspection notes and in the carrying out of the remedial measures suggested in those notes, has had some salutary effect.

Water works.

- | | |
|------------------|---------------------------------------|
| (1) Adoni. | (16) Kurnool. |
| (2) Berhampur. | (17) Madura. |
| (3) Bezvada. | (18) Masulipatam. |
| (4) Chidambaram. | (19) Negapatam. |
| (5) Cocanada. | (20) Nellore. |
| (6) Conjeevaram. | (21) Ootacamund. |
| (7) Coonoor. | (22) Periyakulam. |
| (8) Cuddapah. | (23) Salem. |
| (9) Dindigul. | (24) Tanjore. |
| (10) Ellore. | (25) Tirupati. |
| (11) Erode. | (26) Trichinopoly. |
| (12) Gudiyattam. | (27) Vellore. |
| (13) Guntur. | (28) Vizagapatam (including Waltair). |
| (14) Kodaikanal. | (29) Vizianagram. |
| (15) Kumbakonam. | |

Drainage works.

- (1) Ootacamund.

3. *Works under execution.*—The following works were in course of execution by the Public Works Department during the year :—

- | | |
|--|--|
| (1) Madura drainage. | (8) Narasaraopet water-supply (full power test). |
| (2) Vellore " | (9) Tuticorin water-supply (Tāmbraparni river scheme—full power test). |
| (3) Erode water-supply (since completed—vide item 11, under paragraph 2 above). | (10) Tuticorin water-supply (partial). |
| (4) Ellore water-supply (since completed—vide item 10, under paragraph 2 above). | (11) Madura water works improvements. |
| (5) Rameswaram water-supply. | (12) Tirupati " " |
| (6) Chingleput " | (13) Adoni " " |
| (7) Anantapur " | (14) Cuddapah " " |

4. *Works (included in paragraph 3 above) completed during the year.*—(i) *Erode water works.*—The execution of this scheme was completed and the water works formally opened by the Hon'ble Diwan Bahadur (and now Sir) P. Rajagopala Achariyar, K.C.S.I., in May 1919. The cost of the scheme as finally sanctioned in G.O. No. 160 W., dated 29th January 1918, while it was in course of execution was Rs. 3,45,200, differing little from the amount of the estimate initially sanctioned in G.O. No. 157 W., dated 21st January 1914. The scheme may be briefly described as follows:—

It provides for the supply of 15 gallons per head per diem for an ultimate population of 25,000 (in 1941) of water pumped from a deep pool in the Cauvery at a distance of $3\frac{1}{2}$ miles from the town of Erode where the river flows through a succession of rapids. The water is taken through a suction main carried along the rocky river-bed to the pumping station on the right bank from which the water, after treatment in a coagulating tank and a mechanical gravity filter, is passed into a clear water well, whence it is pumped by a high lift pump to a service reservoir on the Pachiparai hillock 130 feet above the river bed, and thence the supply is distributed to the town by gravitation.

(ii) *Ellore water works.*—The execution of this scheme was also completed during the year and the water works were formally opened by the Hon'ble Mr. M. Ramachandra Rao. The cost of the scheme as sanctioned in G.Os. Nos. 464 W., dated 21st March 1916, and 1069 W., dated 10th August 1917, was Rs. 5,11,000 against the estimate of Rs. 4,93,800 initially sanctioned in G.O. No. 1731 W., dated 29th August 1913. Particulars of this scheme in brief are as follows:—

The Ellore water-supply system provides for a 15 gallon supply for an ultimate population of 58,000 (37,842 at the Census of 1911) in 1941, from the Ellore canal of the Kistna ancient system which contains water for nine months in the year, and is closed for the rest of the year for repairs. For seven months in the year the canal water is passed through a storage tank constructed at the right bank of the canal on the outskirts of the town, and which has a storing capacity for three months' supply to the town, and in this tank the canal water deposits in its passage the major quantity of its silt. During the two months prior to the commencement of the three months' annual closure of the canal for repairs, additional water will be passed into the tank by means of a steam centrifugal pumping engine raising the water level in the tank by $13\frac{1}{2}$ feet above the normal gravitation level so as to meet the town requirements during the three months' closure. The tank water is drawn off by a floating arm outlet to the slow sand filters and passed after filtration to a clear water reservoir and then into a suction well, pumped thence by steam pumps through a cast iron rising main of 14" diameter to a masonry service reservoir with a special grided foundation located in the old fort, the most elevated portion of the town of Ellore, and distributed thence by about ten miles length of cast iron distribution pipes laid throughout the town.

5. *Works under execution by the Sanitary Engineer during the year.*—(1) *Experimental urinal at Chepauk.*—Experiments for testing the efficiency of disinfectants on the floor of the urinal which was advisedly cement-plastered throughout, were in progress during the year.

(2) *Improvements to the Mahamakham tank at Kumbakonam.*—As a preliminary to experiments proposed to be conducted on the "Cavity" principle in connexion with the boring which, as mentioned in the previous annual report, had reached a depth of $237\frac{1}{2}$ feet, arrangements were made to construct a catchwell of 10 feet diameter, and this has been sunk to a depth of $30\frac{1}{2}$ feet below ground level. Further sinking under difficulties was in progress.

(3) *Gudur water-supply.*—Work in connexion with the sinking of the first experimental well to a depth of 40 feet and of the second well to a depth of 25 feet was, after experiencing great many impediments due to the existence of quick-sand for considerable depths, approaching completion by the end of the year.

(4) *Bellary water-supply—Full Power Test.*—The construction of the second well was completed and full power tests conducted on both the first and second wells with satisfactory results so far as the yield was concerned. A full report of

the case with an estimate of Rs. 6,000 for further investigation, was forwarded to Government in October 1919 and the estimate sanctioned in G.O. No. 37 W., dated 7th January 1920.

(5) *Guntūr water-works improvements.*—The execution of a new gallery for improving the town supply at an estimated cost of Rs. 14,500 approved by the Sanitary Board in July 1917 was on provision of funds started in May 1918 and carried down to a depth of 25 feet and for a length of 800 feet by the beginning of the year under report. The yield from the new trench being found rather disappointing, an estimate amounting to Rs. 17,000 for deepening the existing square well and the newly excavated trench for a length of 400 feet was under the orders of the Chief Engineer drawn up and submitted in October 1919. This has since been sanctioned (G.O. No. 274 W., dated 14th February 1920).

6. *Schemes for which plans and estimates were drawn up and forwarded for sanction.*—Detailed plans and estimates for the following eleven water-supply and drainage schemes were drawn up and forwarded by the Sanitary Engineer to Government for sanction during the year, the aggregate estimated cost of the schemes thus submitted being Rs. 74,35,780:—

(1) *Bellary water-supply.*—Revised alternative estimates of Rs. 17,53,580 and Rs. 16,36,500, respectively, for a 15-gallon and a 10-gallon scheme of water-supply from the Hagari site for an ultimate population of 65,000 in Bellary town, and providing for increased rates were forwarded with the Sanitary Engineer's letter No. 277-G., dated 27th March 1919 for sanction.

(2) *Coimbatore water-supply.*—Detailed plans and estimates aggregating Rs. 37,12,700 were forwarded with the Sanitary Engineer's No. 1074-G., dated 23rd December 1919, for the sanction of Government for a 20-gallon scheme of supply by gravitation for an ultimate population of 100,000 in the municipal town of Coimbatore, of potable water taken off from a point in the bed of the Anayarkundi stream 20 miles distant from the town.

(3) *Ongole water-supply.*—Detailed plans and estimates amounting to Rs. 1,15,000 for installation and Rs. 5,500 for annual maintenance were forwarded in March 1919 through the Sanitary Commissioner to the Sanitary Board for being recommended to Government for sanction for 10-gallon scheme (5-gallon rate allowed, however, at the commencement) of supply for an ultimate population of 18,000 (13,286 at the census of 1911) in the municipal town of Ongole, of drinking water proposed to be pumped from an existing well $77\frac{1}{2}$ feet deep, called the "Temple well" or "Kothandaramayya well" at the foot of the Ongole Hill at the south end of the town, by means of 2 sets of Duplex direct acting vertical pumps and engines, through a 7-inch pumping main to a service reservoir of two compartments of 4 hours capacity each, on the slope of the said hill—the total lift involved being 112 feet including allowance for friction and suction—and distributed thence throughout the town by a system of cast iron distributary pipes and fountains.

The scheme with its estimated cost slightly modified by the Chief Engineer to Rs. 1,18,000 was since recommended to Government for sanction by the Sanitary Board in their Resolution No. 486-S., dated 11th November 1919.

(4) *Tellicherry drainage.*—Detailed plans and estimates were forwarded to Government with this office No. 393-G., dated 15th May 1919 for (i) combined disposal works estimated to cost Rs. 55,000 for the disposal of the contents of the drains of the Chali ward of the Tellicherry municipality and of the night-soil of the whole town, comprising a new road 1,050 feet long, 3 night-soil shoots, a line of 9-inch stoneware pipes 6,000 feet long to pick up and carry the contents of these shoots, and also three times the dry weather flow from the Chali ward drains, and a septic tank the effluent from which is proposed to be let into the sandy beach to percolate thence into the Arabian Sea, and for (ii) an alternative proposal estimated to cost Rs. 15,000 for the drainage of the Chali ward alone, providing for a 9-inch cast iron pipe sewer for a length of 955 feet from the end of the Chali drains fitted with a storm water separator.

Estimate No. (i) above was recommended by the Sanitary Engineer for sanction.

(5) *Salem drainage*.—Detailed plans and estimates aggregating Rupees 13,50,000 were forwarded with the Sanitary Engineer's No. 580-G., dated 15th July 1919, through the Sanitary Commissioner to the Sanitary Board for approval and recommendation to Government for sanction. The scheme is designed to serve an ultimate population of 80,000 and provides for the construction of 85 miles of open drains, two intercepting sewers to be laid along the banks of the Tirumanimuttar River running through the town from north-east to south-west. The sewage from these intercepting sewers is to be passed through a screening chamber at the tail end of sewer No. 1 to pumping wells, and pumped thence through an 18-inch cast iron main 5,635 feet long into a septic tank, the effluent from which will be passed on to a sewage farm proposed to be laid out in Annadanapatti Mitta, outside the municipal limits.

(6) *Rajahmundry drainage (partial)*.—This scheme, estimated to cost Rs. 1,90,000, is designed to benefit the portion of the town between the railway line and the left bank of the Godavari divided into seven drainage blocks, and comprises construction of four open drains for carrying both storm water and sillage, two intercepting sewers, a subsidiary pumping station with the necessary pumping machinery for lifting the sillage and storm water from the one intercepting sewer to the other through a 6-inch cast iron rising main, a main pumping station and a sewage farm of 5 acres.

Plans and estimates were forwarded to the Sanitary Board with this office No. 1279-G., dated 27th March 1919.

(7) *Guntur water works improvements*.—Vide item (5) under paragraph 5 above.

(8) *Ootacamund water-supply (southern portion)*.—Detailed plans and estimates amounting to Rs. 34,000, drawn up by the Municipal Council for laying water service branch mains to Manjanakora and Lovedale from the existing Doda-batta water-supply system of the Ootacamund municipality, were referred by Government in the Local Municipal Department to the Sanitary Engineer and scrutinized and returned to them with this office No. 512-G., dated 20th June 1919.

With the total of the estimates modified by the Chief Engineer to Rs. 37,500, the proposals were since received back with the Sanitary Board Proceedings No. 444-S., dated 4th October 1919, for the Sanitary Engineer's sanction, this being within his powers under recent orders, and sanctioned in this office No. 1656-M., dated 14th October 1919.

(9) *Drainage of the new Engineering College premises at Guindy*.—Estimated cost Rs. 75,000.

Plans and estimates were forwarded with this office No. 165-G., dated 21st February 1919, to the Chief Engineer for sanction. The scheme provides for the discharge of the sillage from the several buildings connected with the College by means of pipe connexions into a stoneware pipe main sewer of a total length of 3,380 feet and of 6 inches diameter for the first 300 feet from the College Principal's quarters with gradient of 1 in 135, and of 9 inches diameter for the remaining 3,080 feet with a gradient of 1 in 230, branch sewers from flush latrines, pumping pits, etc., the contents of the main sewer being discharged through a screening chamber and over a V-notch or gauging weir into two pumping pits, whence the sewage will be pumped by automatic electric driven centrifugal pumps into four masonry septic tanks of a total capacity of 13,780 gallons equal to about half the daily flow, and thence led on partly to a sewage farm and partly to a bacterial filter; and the effluent from the latter will be conveyed by a closed drain to the deep bed of a tank at Adyar.

(10) *The new Engineering College water-supply at Guindy*.—Detailed plans and estimates amounting to Rs. 1,10,000 were submitted with this office No. 815-G., dated 4th October 1919, to the Chief Engineer for sanction.

The scheme is designed to supply 25,000 gallons per diem of potable water from an infiltration well of 10 feet diameter built to a depth of 28 feet below ground level at an estimated cost of Rs. 4,415 at the site of a disused but tested well in the compound of the Teachers' College, Saidapet, from which the water will be pumped by means of a steam pumping plant costing Rs. 3,200 annually for maintenance or by electric pumping plant costing Rs. 3,739 for similar maintenance, and conveyed by a 5-inch cast iron gravitation main 3,114 feet long passing

in its course across the Adyar river-bed to the College site where it will be supplied by a distribution system of 5" to 2½" cast iron pipes, sluice valves, scour valves, hydrants and fountains.

(11) *Salem water-supply improvements*.—An estimate of Rs. 20,000 for widening the supply channel to the Panamarathupatti tank was forwarded to Government in this office No. 513-G., dated 27th June 1919, approved by the Chief Engineer in his Memo. No. 5862-O., dated 10th September 1919, and accorded professional sanction in this office No. 1577 M., dated 30th September 1919.

7. *Schemes for which plans and estimates were prepared and are under scrutiny with the Sanitary Engineer or were returned to the Deputy Sanitary Engineers for revision*.—Plans and estimates submitted by the Deputy Sanitary Engineers for the following schemes were under scrutiny in this office or returned to the Deputy Sanitary Engineers for revision during the year:—

	Approximately estimated cost of the scheme.
	Rs.
(1) Bezvada drainage	5,53,000
(2) Berhampur drainage (partial)	1,70,000
(3) Tiruvannamalai water-supply	4,00,000
(4) Bimilipatan drainage (returned for revision)	37,200
(5) Calicut drainage	12,00,000
(6) Kodalkanal water-works extension	40,000

(This scheme has since had to be dropped in favour of an alternative proposal preferred by the Municipal Council.)

8. *Schemes for which plans and estimates were under preparation*.—Plans and estimates for the following schemes were under preparation during the year:—

	Approximately estimated cost of the scheme.
	Rs.
(1) Gudur water-supply	2,35,000
(2) Ellore drainage	8,10,000
(3) Madras Lunatic Asylum drainage	...
(4) Rajahmundry water-supply	...
(5) Erode drainage	1,50,000
(6) Mannargudi water-supply	...
(7) Srirangam water-supply	...

(Separate scheme, i.e., as distinguished from a combined scheme of supply for Trichinopoly and Srirangam.)

(8) Berhampur drainage
(Completion of the plans and estimates was temporarily suspended under G.O. No. 2153 M., dated 22nd November 1919).

9. *Schemes for which investigation was completed, but the preparation of plans and estimates is to be taken up by the Deputy Sanitary Engineers*.—The following are the schemes for which investigation was completed, but preparation of plans and estimates was to be taken up in due course:—

- (1) Kumbakonam drainage.
- (2) Tenali drainage.
- (3) Guntur drainage.
- (4) Nandyal drainage.
- (5) Bellary drainage.
- (6) Chidambaram drainage.
- (7) Mannargudi water supply.
- (8) Palghat water-supply.
- (9) Cochin drainage.
- (10) Periyakulam drainage.
- (11) Tinnevely drainage.
- (12) Chittoor drainage.
- (13) Pollachi water-supply.
- (14) Palni water-supply.
- (15) Diindigul water-supply improvements.
- (16) Tirappur water-supply.
- (17) Mangalore water-supply (from the Hassanar valley).
- (18) Calicut water-supply.

(Quality and quantity tests of the Kallattur river water, the proposed source.)

10. *Schemes which are under investigation by the Deputy Sanitary Engineers.*—The investigation of the following schemes was in progress during the year :—

(1) *Cockia water-supply—Deep boring.*—The sample water from the layer at 359 feet below ground level having been considered unsatisfactory, the boring pipe was lifted up, and with its bottom at about 320 feet the water was pronounced potable and the yield found to be at about 35 gallons a minute, working the borehole on the "Cavity" principle. It is now being tested with a 40 feet length of 7" Ashford Patent Strainer.

(2) *Tirucalur water-supply—Deep boring.*—The boring with a 5" pipe, when it reached a depth of 214 feet below ground level struck a bed of fine sand and silt after passing through a thick layer of stiff clay. As it was difficult to sink the 5" pipe any further, a 4" pipe inside the former was sunk to 227 feet below ground and the lining pipes pressed down to 219 feet. Further work was suspended pending sanction to a revised estimate for the investigation.

(3) *Srivilliputhur water-supply.*—Investigation was in progress.

(4) *Alagarkoil water-supply.*—(for an important place of pilgrimage in Madura district)—Investigation was in progress.

(5) *Peddapuram water-supply.*—Investigation almost completed.

(6) *Parlakimedi water-supply.*—An experimental well sunk.

(7) *Hindupur water-supply.*—(from the Pennar river source).

(8) *Pennakonda water-supply.*—Investigation completed.

(9) *Tiruvannamalai water-supply—Kalyani well scheme.*

(10) *Gudur water-supply.*—Investigation since completed—vide item (3) under paragraph 5 above.

(11) *Dharmavaram water-supply extension.*

(12) *Bellary water-supply full power test.*—Vide item (4) under paragraph 5 above.

(13) *Kalahasti water-supply.*—Investigation sanctioned in G.O. No. 391 L., dated 22nd March 1919, was in progress.

(14) *Tiruchanur water-supply.*—Investigation sanctioned in G.O. No. 391 L., dated 22nd March 1919, was in progress.

(15) *Tirupati drainage.*—(Investigation sanctioned in G.O. No. 775 M. Mis., dated 14th May 1919, was in progress.)

(16) *Chittoor water-supply.*

(17) *Uddalupah drainage.*

(18) *Guntur water-supply improvements.*—Vide item (5) under paragraph 5 above.

11. *Works for which preliminary reports were received from the Deputy Sanitary Engineers and were under scrutiny in the Sanitary Engineer's office.*—Preliminary reports on the following works were received from the Deputy Sanitary Engineers and were under scrutiny during the year :—

(1) *Dindigul Dobykhana water-supply.*

(2) *Septic tank in the Coimbatore Hospital.*

(3) *Septic tank in the American Mission High School, Pasumalai, Madura district.*

(4) *Disposal of night soil in the Madura city.*

(5) *Removal of the nuisance arising from sewage stagnation in the General Hospital, Madras.*

(6) *Working of the Lethal Chamber at Madura.*

12. *Minor Sanitary Works.*—Of 292 estimates for minor sanitary works received by the Sanitary Engineer from local bodies, etc., during the year, 25 estimates aggregating Rs. 19,961 were accorded sanction by the Deputy Sanitary Engineers themselves under the powers vested in them by G.O. No. 641 W., dated 20th March 1914; 206 estimates, each not exceeding Rs. 50,000 and aggregating Rs. 17,87,801 were sanctioned by the Sanitary Engineer to Government under G.O. No. 508 L., dated 27th June 1919, and seven estimates aggregating Rs. 2,58,800, were with the Sanitary Engineer's remarks and recommendations after scrutiny forwarded to the Sanitary Board for sanction. Please see Appendix A for a

statement of estimates for minor sanitary works dealt with by the Sanitary Engineer during the year (exclusive of those mentioned above as having been sanctioned by the Deputy Sanitary Engineers).

13. *Type designs.*—The following three designs were drawn up and forwarded to the Sanitary Board for approval and issue to local bodies for being adopted as type designs :—

(1) Design for engine driver's quarters.

(2) Alternative design for a flush-out latrine.

(3) Design for a rat-proof granary for storing grains.

14. *Improvements to the Municipal water-works pumping plant carried out during the year under the supervision of the Boiler Inspection Department :—*

(1) The following Municipal water-works machinery were for increased efficiency in their working, dismantled and put in repair by, or under the supervision of, the Chief Inspector of Boilers :—

(i) *Bezicada.*—Engines and pumps Nos. 1 and 2.

(ii) *Cocanada.*—Nos. 1 and 3 engines and pumps.

(iii) *Dindigul.*—No. 2 engine and pump.

(iv) *Masulipatam.*—A portion of the Jewell filters, the Sisson engine of the scour well pump of the coagulating tanks, and the donkey feed pump of the subsidiary pumping station.

(v) *Nellore.*—No. 2 engine of the main pumping station and No. 2 engine of the subsidiary pumping station.

(vi) *Trichinopoly.*—No. 4 engine and pump of the main pumping station and No. 1 engine and pump of the subsidiary pumping station.

(2) Arrangements were made to replace the crank shaft of the Blackstone Oil engine at the Kurnool water-works pumping station and the feed pump of the subsidiary pumping station of the Masulipatam water-works.

(3) New chimneys were made in replacement of the old corroded ones in the Tanjore and Trichinopoly (main) pumping stations.

(4) The pumping plant of the newly opened water-works in the municipal town of Erode was tested by the Chief Inspector of Boilers and handed over to the Municipal Council. Owing to the failure of the suction pipe during heavy floods in the river, a temporary arrangement was made to pump water from a sump close to the river bank, and arrangements for a permanent auxiliary suction to prevent possible failure of water-supply in the future were in contemplation.

(5) No. 4 engine and pump of the Tanjore water-works pumping station were removed from their foundations and a new base made of girders and plates was manufactured to secure them thereto.

(6) *Madura water-works pumping plant.*—(i) The machinery required for the pumping station of the Madura water-works at Kochadai was made ready for the erection of the plant thereat.

(ii) The Municipal fire engine, Madura, was installed at the foot of the south approach to the Vaigai bridge to pump into the sump well and the 10th Municipal ward during the day and to relieve the main pumps from night pumping.

(7) Among the improvements to the Conjeeveram water-works pumping plant, which were in progress during the year, was an alteration of the suction gas producer so as to burn charcoal instead of Anthracite coal.

15. A statement giving the results of the working of the pumping plant in the several municipalities is attached hereto as Appendix B.

16. *Engine drivers' examination.*—Two examinations were held during the year under report, one in July and the other in December. Forty-nine candidates appeared for the examinations in "Competency" and 27 in "Service"; of these, 32 in all were successful, viz., 16 in "Competency" and 16 in "Service".

17. *Water-works filters' examination.*—Only one examination was held during the year in September. Of the eight candidates who appeared for it, one was successful.

APPENDIX B.

Statement of results of pumping at water-works possessing pumping plant 1918-19.

Stations.	(1)	Gallons of water pumped.	(2)	Average lift in feet.	(3)	Total consumption of fuel.	(4)	Description of fuel.	(5)	Pounds of fuel consumed per 1,000 gallons.	(6)	Cost per million gallons raised 1 foot high.	(7)	Pounds of fuel consumed per pump horse-power per hour.	(8)	Remarks.	(9)
Bezwada	"	224,518,917	GALLS.	77.3	FT.	21 18 16	TONS, CWT, LB.	Liquid fuel ...	LB.	0.318	0.318	0 8 18	0 8 18	0.81	LD.	Diesel oil engines with belt driven geared Worthington triplex deep well pumps.	
Chidambaram	"	199,301,103	"	74.26	"	22 19 103	"	Do. ...	"	0.311	0.311	0 7 211	0 7 211	0.04	"	Hathorn Davy horizontal compound surface condensing engines and pumps.	
Cocanada	"	144,245,100	"	49.39	"	378 11 0	"	Do. ...	"	4.32	4.32	1 1 78	1 1 78	17.6	"	Horizontal direct acting Worthington compound surface condensing engines and pumps.	
Conjeveram	"	141,423,919	"	48.80	"	233 16 110	"	Charcoal, coal and wood.	"	3.73	3.73	1 0 139	1 0 139	15.23	"	Horizontal direct acting Worthington compound engine and pumps and Crossley gas engine driving geared pumps by means of a belt.	
Kumbhakuram	"	232,020,379	"	46.4	"	352 17 11	"	Do. ...	"	3.51	3.51	1 0 736	1 0 736	15.13	"	Blackstone oil engine and belt driven centrifugal pump.	
Kernool	"	3,142,672	"	39.56	"	1 476 965	"	Kerosene-oil.	"	7.03	7.03	6 12 34	6 12 34	4.22	"	Vertical compound steam engines with belt driven twin series Gwynne's centrifugal pump and Blackstone and Westinghouse oil engines with belt driven Gwynne's centrifugal pumps.	
Madura	"	107,562,326	"	45.5	"	433 574 99	"	Wood, liquid fuel and kerosene-oil.	"	5.15	5.15	2 3 11.9	2 3 11.9	22.53	"	Horizontal direct acting Worthington triple expansion engines and pumps.	
Nagapattinam	"	559,723,073	"	44.53	"	604 17 0	"	Do. ...	"	2.45	2.45	0 14 577	0 14 577	10.89	"	Vertical direct acting Worthington triple expansion engines and pumps.	
Rallare (main)	"	159,739,849	"	65.82	"	31 5 20	"	Kerosene-oil.	"	0.44	0.44	0 9 67	0 9 67	1.31	"	Hornby oil engines with belt driven Worthington triplex geared deep well pumps.	
Do. (sub)	"	6,728,674	"	39.13	"	2 7 89	"	Do. ...	"	0.79	0.79	4 3 88	4 3 88	4.69	"	Do. ...	
Tiruchinopoly (main)	"	736,370,817	"	111.99	"	1,602 14 28	"	Coal and wood.	"	2.83	2.83	0 10 4.6	0 10 4.6	8.62	"	Vertical direct acting Worthington triple expansion engines and pumps.	
Do. (sub)	"	766,673,636	"	105.45	"	1,499 2 62	"	Do. ...	"	4.26	4.26	0 9 872	0 9 872	7.98	"	Horizontal direct acting Worthington triple expansion engines and pumps.	
Vidyanagar	"	59,911,552	"	62.24	"	111 13 98	"	Do. ...	"	4.68	4.68	1 7 102	1 7 102	14.71	"	Vertical direct acting Worthington triple expansion engines and pumps.	
Walhair	"	103,986,399	"	209.41	"	563 15 104	"	Do. ...	"	8.37	8.37	0 9 54	0 9 54	7.91	"	Hornby oil engines with belt driven geared Worthington triplex pumps.	

[Note.—The figures in thick type are the averages of the preceding five years.]

THE
TWENTY-FOURTH ANNUAL REPORT
OF THE
SANITARY BOARD, MADRAS, FOR 1919.

From the Sanitary Engineer to Government, No. 863 G., dated 21st April 1920, forwarding his thirtieth annual report for the year 1919.

Endorsement thereon by the Chief Engineer, Public Works Department, No. 3148 C., dated 7th May 1920.

RESOLUTION:—

With reference to rule 23 of the rules regulating the constitution and functions of the Sanitary Board issued with G.O. No. 1500 L., dated 27th August 1914, the annual report of the Sanitary Engineer for the year 1919 will be submitted to Government together with the report of the Board itself as hereunder. The Sanitary Commissioner having expressed his inability to submit his report in time owing to the delay on the part of certain municipalities and district boards in the submission of their returns, the report of the Sanitary Commissioner will be forwarded separately as soon as it is received.

2. The Sanitary Board of this Presidency is vested with no executive control. Its functions are confined to advising local bodies and Government in regard to sanitary schemes before execution and to lay down and issue for guidance type plans and estimates.

3. The personnel of the Board during the year was as shown below:—

(i) Mr. W. Hutton, A.M.C.E., Chief Engineer and Joint Secretary to Government, Public Works Department, was the President of the Board.

(ii) Major-General G. G. Giffard, C.S.I., I.M.S., Surgeon-General with the Government of Madras, was the medical member except during the period from 12th February to 26th April 1919, when Lieut.-Col. W. J. Niblock, I.M.S., acted instead.

(iii) Mr. H. G. Stokes, C.I.E., I.C.S., Secretary to Government, Local and Municipal Department, was the civil member till the beginning of October 1919, and Messrs. L. A. Cammiade, B.A., B.L., A. E. G. Moscardi, I.C.S., and F. B. Evans, I.C.S., acted during the remaining period.

(iv) Mr. R. F. Stoney, Deputy Chief Engineer and Under Secretary to Government, Public Works Department, was the Secretary to the Board till the middle of April 1919, when Mr. S. Bhaskara Ayyar, B.A., succeeded him. Mr. C. Poddie acted as Secretary from 28th August to 9th October 1919 and from 13th November to 14th December 1919 when Mr. Bhaskara Ayyar was on other duty as Deputy Secretary to Government, Public Works Department.

4. The constitution of the Board continued to be the same, but its powers of final approval have been raised in G.O. No. 805 L., dated 27th June 1919, in respect of the maximum limit of the estimated cost of schemes from Rs. 20,000 to Rs. 50,000.

5. During the year the Board recommended to Government a revised programme of major sanitary schemes showing the order of urgency and it was approved in G.O. No. 2153 M., dated 22nd December 1919.

6. The undermentioned type designs were approved by the Board and circulated with schedules and specifications for adoption by local bodies:—

- (1) Flush latrine. (Type design No. 173.)
- (2) Engine drivers' quarters. (Type design No. 174.)
- (3) Rat proof grain godowns. (Type designs Nos. 175 and 176.)
- (4) Temporary post-mortem shed. (Type design No. 177.)

7. During the year the Board received 13 schemes estimated to cost Rupees 73,97,880, of which 9 schemes, estimated to cost Rs. 3,91,600, were finally examined by the Board. The remaining four schemes, estimated to cost Rs. 70,06,280, were, after preliminary examination, referred to the Chief Engineer, Public Works Department, for technical scrutiny which is since understood to have been almost completed; action is being taken towards getting them sanctioned at an early date. Out of the 13 schemes, 11 amounting to Rs. 73,36,780 relate to municipalities and 2, estimated to cost Rs. 61,000, relate to local boards.

8. The total number of schemes approved by the Board during the year was 7 estimated to cost Rs. 3,33,800 in the aggregate. Of these two schemes (1) construction of a market in connexion with the Butterworth road extension scheme at Trichinopoly and (2) the extension of water-supply to the southern parts of the Ootacamund Municipality were within the Board's power of final approval. It is reported that No. (1) could not be taken up for execution during the year for want of funds and that the required materials for No. (2) have been indented for from various firms.

9. The following five schemes were recommended to Government for sanction:—

	Estimated cost.
	RS.
(1) Repalli town extension scheme	36,300
(2) Sanitary improvements to the Pather channel at Chittoor ...	25,000
(3) Pattamangalam town extension in Mayavaram Municipality.	36,000
(4) Proddatur town extension scheme	61,000
(5) Ongole water-supply scheme	1,15,000

Of the above it is reported that scheme No. (2) has been completed and that the work on Nos. (1) and (3) was in progress at the close of the year.

SANITARY BOARD'S OFFICE, MADRAS,
31st May 1920.

S. BHASKARA AYYAR,
Secretary, Sanitary Board.

Government of Madras

LOCAL AND MUNICIPAL DEPARTMENT

G.O. No. 80 P.H., 26th January 1921

Report

Sanitation — for 1919—recorded with remarks.

READ—the following papers:—

I

Proceedings of the Sanitary Board, No. 262-S., dated 27th May 1920.

ABSTRACT.—Forwarding to the Government the thirtieth annual report of the Sanitary Engineer together with the twenty-fourth annual report of the Sanitary Board for 1919.

II

Proceedings of the Sanitary Board, No. 492-S., dated 18th October 1920.

ABSTRACT.—Forwarding to the Government the report of the Sanitary Commissioner for 1919.

Order—No. 80 P.H., dated 26th January 1921.

Recorded.

2. The report of the Sanitary Commissioner for 1919 was received by the Government more than five months after the due date. The delay is no doubt due largely to the congestion of work and depletion of personnel prevailing throughout the year 1920, but the utility of the report is gravely impaired by its late receipt, and the failure of certain local authorities to submit their returns punctually is unsatisfactory. The Collectors of Ganjam, Vizagapatam, Malabar, Tanjore, Chingloput and Nellore, the Presidents of District Boards of Gōdāvari and Kurnool and the Chairmen of the Municipal Councils of Cuddalore, Bellary, Vaniyambadi and Kurnool are requested to see that their returns are in future compiled in time.

3. *Birth-rate.*—In every district the birth-rate is markedly below the quinquennial average. Comparative figures for the several districts are given in Annexure A to this order.

4. Defective registration is the cause customarily assigned for the decline and the fact that the birth-rate in many cases is exceeded by the death-rate supports this conjecture. No doubt the census of 1921 will provide data for determining the extent to which registration is at fault, but the Government consider that the Sanitary Commissioner should endeavour by intensive examination in selected areas in each district to arrive at some co-efficient of error, to ascertain why in some areas the birth-rate is twice that in others, and to decide to what extent, if at all, the statistical decline in birth-rate is real. The Board of Revenue has expressed the opinion that the registration of vital statistics is less

satisfactory in areas where it is compulsory than in areas to which compulsion has not been extended. The Sanitary Commissioner should be in a position to verify the accuracy of this view. The correct registration of births is of more than academical interest, as it should constitute the foundation of the policy of local bodies in regard to vaccination and maternity relief. The attention of all presidents of local boards and chairmen of municipal councils is drawn to the dubiousness of their birth-rate statistics, and the Government expect them to exercise particular vigilance in this branch of administration.

5. *Death-rate.*—Public health during 1919 was under all heads much better than in 1918. The death-rate in most districts was below the quinquennial average as will be seen from Annexure B to this order.

6. The Presidency average would have been more satisfactory but for the amazing increase in Malabar, South Kanara and Ganjam. No cause is assigned in the report for the heavy mortality in these areas and special steps should have been taken to ascertain whether remediable causes exist.

7. Another fact of widespread importance revealed by the mortality statistics is the very high rate prevailing generally among Muhammadans as compared with other communities. The Sanitary Commissioner is requested to examine closely the reasons for this high mortality.

8. *Infantile mortality* is a problem of growing public interest and one which local bodies could alleviate at relatively slight expense, if they would earnestly tackle it. The statistics compiled in the Sanitary Commissioner's office deserve publicity, in order that the local bodies responsible may know where they stand. (See Annexure C to this order.)

These statements do not reflect credit on local self-government. It is true that the ratio has fallen below that of 1918 in almost all areas, but in many it is still well above the quinquennial average and incompatible with enlightened administration. It is of little use to recapitulate in general terms the causes assigned in the report for 1918. The Government require constructive proposals for bettering the conditions of infancy from each of the local bodies within whose jurisdiction the infant mortality exceeds the Presidency average.

9. In Madras City infant mortality fell from 360.7 in 1918 to 332.1 in 1919, but this is well above the quinquennial average of 302.1. Some improvement was effected under the Child Welfare Scheme undertaken by the Corporation towards the close of 1917. In the twelve months ending with September 30, 1919, 1,052 infants were tended under the scheme in the Triplicane centre, against 681 in the previous year. The mortality among the infants so tended worked out at 276.8. Work under the scheme is expanding, and additional centres were opened in Washermanpet and Parasawakam. It is clear that a much more comprehensive organization is necessary, if Madras City is to redeem its reputation as one of the deadliest towns in the Presidency.

10. *Cholera.*—The number of deaths from cholera fell from 122,263 in 1918 to 93,262 in 1919, but this figure is 34,323 in excess of the mortality of 1917. Useful work was done by the eight provincial cholera parties which operated in the worst affected districts. The Government await the Sanitary Commissioner's proposals for improving the working of these parties, but they cannot undertake to relieve local bodies of responsibility for this branch of public health administration, and they hope that no time will be lost in constituting Public Health Boards for each district with a view to co-ordinating and expanding the work of such statutory and voluntary agencies as exist or may be brought into being.

11. Cholera prevention is not, however, likely to be effective unless closer attention is paid than hitherto to the history of each epidemic with a view to determine the areas most susceptible to infection and the periodicity of the disease within each such area. The report is silent on this vital point, and until such data are collected and collated, the sanitary staff must blindly follow the epidemic instead of forestalling it. Such information is also needed before any programme worth having can be drawn up for the protection of drinking water in rural areas.

The Sanitary Commissioner and his deputies are requested to devote personal attention to this aspect of preventive work and to assist the local authorities in defining their policy so as to give protection where it is most needed.

12. *Water-supply.*—The provision of protected water-supply in municipal areas is regrettably backward. In the year under report no less than 45 out of 74 municipalities had no protected supply. Two installations were under construction, the investigation of three schemes was completed and that of twelve schemes was in progress. Unless means can be found for financing these schemes, it is unlikely that the present rate of progress can be accelerated.

It is gratifying to note that Municipal Councils are beginning to realize the importance of complying with the advice of the Sanitary Engineer and carrying out the measures suggested by him to remedy defects in these installations.

13. Cholera statistics for certain protected towns are not altogether reassuring.

Town.	Number of deaths.	Percentage to total number of deaths.	Rate per mille.	Town.	Number of deaths.	Percentage to total number of deaths.	Rate per mille.
Berhampur	55	6.5	2.7	Madura	95	1.9	0.7
Bezwa	42	2.0	1.3	Nagapatam	41	2.1	0.7
Cocanada	16	0.8	0.3	Nellore	73	6.9	2.2
Conjeevaram	137	7.3	2.9	Salem	256	12.0	4.3
Cuddapah	20	3.4	1.1	Tanjore	41	1.8	0.7
Dindigul	67	3.2	2.7	Tirupati	56	8.6	3.4
Gudiyattam	83	12.1	3.8	Trichinopoly	122	3.0	1.0
Kumbakonam	20	1.0	0.3	Vellore	88	7.2	1.8
Madras	630	3.4	1.3	Vizagapatam	64	4.2	1.5
				Vizianagram	11	0.8	0.3

The Government observe that in several instances cholera has attained the dimensions of an epidemic. No reason is assigned in the report for these outbreaks, nor is mention made of any steps being taken to track down the sources of infection or to guard against recurrence. It is unlikely that infection was caused by the pollution of the protected supply, but whether any effort was made to verify this, is not stated. Some towns, it is true, are only partially served with pipe water, but in such cases protection obviously requires extension. The remarks in paragraph 11 above regarding the history of cholera epidemics generally apply with greater force to municipalities with protected water-supply, and the Government hope that the officers of the Sanitary Department and the local authorities concerned will take to heart the suggestions there made. The action taken on these suggestions should be noted hereafter in the administration reports both of the Sanitary Commissioner and of the local bodies affected.

14. *Small-pox.*—Small-pox mortality declined from 58,752 to 41,732. The incidence of small-pox in particular localities is more variable than cholera, but is more easily preventible. The controlling factor, vaccination, is dealt with in another report (recorded in G.O. No. 81-P.H., dated 23th January 1921), but the salient points brought to light in that report may be briefly summarised here.

15. The statistics of vaccination do not appear to bear direct relation to small-pox mortality, a high vaccination rate being in some areas concurrent with a high death-rate from small-pox, and in others with a low death-rate, and *vice versa*. The reason for the concurrence of a high death-rate with a high vaccination rate, and of a low death-rate with a low vaccination rate is to be found in the Sanitary Commissioner's statement attributing the decline in vaccination "to the absence or less prevalence of small-pox." The Government cannot accept this explanation, and would impress on all local authorities their responsibility for rendering an epidemic impossible in the areas committed to their charge.

16. The policy of the Sanitary Department and of local bodies as regards revaccination is still nebulous. No information is given in either of the reports as to whether revaccination is insisted on, on admission into schools or into public

service, or whether any effort at all is made to educate public opinion as to the need for revaccination. The Government would also suggest that on the outbreak of an epidemic, systematic enquiries should be made in selected areas as to the number of protected persons who contract and succumb to the disease.

17. *Plague*.—Plague accounted for 5,645 deaths against 12,859 in 1918. The number of persons inoculated with anti-plague vaccine is not reported, nor is mention made of the steps taken to combat epidemics and guard against re-infection. The localities most exposed to infection are well known, as are also the sources of infection. It should be possible for the Sanitary Commissioner, in the light of experience accumulated since plague first appeared in this Presidency, to draw up a comprehensive programme of preventive measures. It should be possible to eliminate the dangerous features of known foci of infection, such as granaries and railway premises, by intensive rat destruction or by prohibiting the storage of grain in godowns which are not rat proof or which are situated in densely populated areas. Even methods of storing grain for household use deserve attention, and villagers should be encouraged to segregate arrivals from infected places as provided for by Regulation. The Sanitary Commissioner is requested to give attention to such measures, and to inform the Government of what is being or should be done.

18. *Other diseases*.—The incidence of fevers, dysentery and diarrhoea and respiratory diseases is less variable from year to year than that of epidemics, and the susceptibility of particular localities to one or more of these classes of ailment is readily ascertainable.

Comparative figures are shown in annexures D, E and F to this order.

19. The variations between the several districts are presumably due to definite and persistent causes, and, after allowing for such factors as faulty registration and local epidemics of influenza, it should be possible for the Sanitary Commissioner and his deputies to localise these causes, and to draw up a definite programme of intensive work in order to eradicate or counteract them. Unless sustained and systematic investigation is made, and until policy is based on ascertained fact, the public health of the Presidency is not likely to improve.

20. The record of "fevers" is notoriously vague. It should be possible by careful diagnosis in selected areas to determine for each district the approximate proportion which each variety of "fever" bears to the total mortality under this head, and to decide from the figures so obtained what special preventive action should be taken in each locality. It is only on such data that the activities of local health and welfare associations can be directed into the right channels and make good the defects peculiar to the localities in which they work. Malaria in particular is a disease which can only be eradicated by localising and removing the sources of infection, and "anti-malarial measures" which are not based on ascertained fact are bound to fail, however generously quinine is distributed.

21. The inflated figures under "other causes" is another unsatisfactory feature of the statistical record. In rural areas the rate under this head for 1919 is 9.7 and in town circles the figure is 15.0. It should be possible, by detailed investigation in selected centres, to dispel at least to some extent the mystery which obscures this "all absorbing head."

22. The deaths reported under rabies numbered 62, of which no less than 17 occurred in Trichinopoly district. It is not stated whether any of these cases were treated at the Pasteur Institute. The responsibility for sending those who are bitten to Coonoor rests primarily on the local authorities, and the Sanitary Commissioner is requested in future to institute enquiries as to the action taken in each case of death from this cause as soon as it is reported.

23. Conservancy is still defective. It is unsatisfactory to note that public latrine accommodation is insufficient in no less than 22 municipalities, including some of the most important towns in the Presidency, and that the number of insanitary latrines in use is large. Nearly two-thirds of the total number of houses in district municipalities are unprovided with private latrines, and the

prevailing methods of disposing of nightsoil and sullage are crude, wasteful and offensive. Sewage farms are maintained by 13 municipalities, but little interest is shown in their exploitation. The Government desire that the Sanitary Commissioner and his deputies should in future devote more attention to the economic disposal of the waste products of conservancy and assist local bodies in devising methods which are more profitable and more consistent with hygiene. The failure of local bodies to set aside a depreciation reserve for the renewal of conservancy plant is likely to land them in serious difficulties.

24. The report of the Sanitary Engineer shows good progress in the investigation of drainage schemes, and it is not his fault that only one scheme has been carried through. The Government hope that the general public will awaken to the importance of proper drainage and insist on an acceleration of the programme of works to be executed. Four type-designs have been approved by the Sanitary Board in the year under report. In future reports the Government require information as to the number of buildings and installations actually constructed on type-designs and a note on their success or failure.

25. The reluctance of professional men to accept service under municipal councils is a menace to the future of sanitation in this Presidency. Of the two appointments sanctioned for first-class health officers one is at present vacant, and of the 14 posts sanctioned for second-class health officers only three are filled. No candidates have appeared for training as health officers for the past three years. Even men qualified as sanitary inspectors avoid service under local bodies, if they can get other employment.

26. The year's report does not reveal any marked advance in policy or efficiency, but more could hardly be expected considering that in the first eight months of the year there were no less than five changes in the personnel of the Sanitary Commissionership, and that during the last four months the duties of the Sanitary Commissioner were discharged by the Surgeon-General himself in addition to his full-time duties as Surgeon-General. The Government are pleased to note that during the short term at his disposal Surgeon-General G. G. Giffard was able to carry out personal inspection in 17 of the most important centres of the Presidency.

— (By order of the Government, Ministry of Local Self-Government)

F. J. RICHARDS,
Secretary to Government.

To the Surgeon-General (Medical.)
" the Surgeon-General (Sanitary.)
" the Sanitary Engineer.
" the Assistant Quartermaster-General (with O.L.).
" the Inspector-General of Police.
" the Inspector-General of Prisons.
" the Accountant-General.
" the Director of Public Instruction.
" all Collectors.
" all Chairmen, Municipal Councils.
" all Presidents, District Boards.
" the President, Corporation of Madras.
" the Revenue Department.
" the Public Works Department.
" the Publicity Officer.
" the Inspector of Municipalities.
Editors' Table.

Endorsement—No. 80-A P.H., dated 23th January 1921.

Copy to the Government of India, Department of Education.

(By order of the Government, Ministry of Local Self-Government)

F. J. RICHARDS,
Secretary to Government.

[Annexures.]

ANNEXURE A.

I. Districts—Birth-rate.

Serial No.	District.	Rate for year under report.	Rate for 5 years ending 1918.	Serial No.	District.	Rate for year under report.	Rate for 5 years ending 1918.
1	Nellore	16.8	24.9	14	Presidency average ...	25.5	31.7
2	South Arcot	19.2	27.4	15	Anantapur	25.6	32.4
3	Bellary	20.8	29.9	16	Coimbatore	26.5	30.7
4	Ganjama (excluding agency).	22.0	27.0	17	Madras	26.9	33.0
5	Ramanud	22.2	28.7	18	North Arcot	27.3	34.7
6	Cuddapah	22.3	29.1	19	Vizagapatnam (excluding agency).	27.5	34.0
7	Kurnool	22.6	29.2	20	Kistna	27.7	32.9
8	Chittoor	23.5	31.6	21	Tinnevely	28.0	33.2
9	Tanjore	24.3	28.4	22	Chingleput	28.8	35.5
10	Trichinopoly	24.3	30.3	23	Malabar	29.7	37.4
11	Godavari (excluding agency).	25.2	32.3	24	Guntur	30.7	37.8
12	Madura	25.4	29.1		South Kanara	31.7	37.5
13	The Nilgiris	25.5	30.7				

II. Municipalities—Birth-rate.

Serial No.	Municipality.	Rate in 1919.	Quin- quennial average.	Serial No.	Municipality.	Rate in 1919.	Quin- quennial average.
1	Peddipparam	16.2	21.3	39	Tellicherry	32.0	35.0
2	Adoni	17.0	20.8	40	Cuddapah	32.4	31.1
3	Villupuram	18.9	21.5	41	Guntur	32.4	41.1
4	Dharmaparam	19.2	27.3	42	Tanjore	32.5	36.6
5	Vizagapatnam	20.5	30.1	43	Miyavararam	32.5	33.2
6	Berhampur	21.5	30.1	44	Presidency average ...	32.5	36.5
7	Chitacole	21.6	30.2	45	Tallicherry	32.7	35.2
8	Nandyal	21.7	27.9	46	Palamecottah	33.0	39.2
9	Tiruppur	22.1	18.5	47	Srivilliputtur	34.3	41.3
10	Sitaramam	22.2	23.3	48	Mesulipattam	34.6	32.8
11	Tiruvallur	22.3	27.8	49	Bellary	34.7	39.7
12	Tirupathi	22.8	23.0	50	Vellore	34.9	42.1
13	Hosur	23.0	30.6	51	Palghat	35.0	41.3
14	Gudivallam	24.2	28.5	52	Coonoor	35.0	35.9
15	Udumalpet	24.3	16.7	53	Coimbatore	35.1	4.4
16	Kanichikottam	24.6	25.6	54	Vizianagaram	35.1	36.2
17	Nellore	25.6	31.1	55	Chingleput	36.1	41.9
18	Nagapattinam	26.1	27.7	56	Madura	36.2	39.7
19	Proddatur	26.2	21.3	57	Cuddalore	36.2	35.9
20	Parthasarathi	26.5	35.6	58	Cochin	36.5	35.3
21	Coimbatore	26.7	33.3	59	Madras	36.6	39.4
22	Bodinayakanur	27.2	28.3	60	Salem	37.0	43.9
23	Trichinopoly	27.2	30.1	61	Calicut	37.1	39.0
24	Anantapur	27.3	32.9	62	Wajahpet	37.4	45.2
25	Rajahmundry	27.3	39.0	63	Cojaveeram	37.9	40.3
26	Tenali	28.0	29.5	64	Tinnevely	38.4	41.7
27	Ongole	28.0	30.1	65	Virudupatti	38.5	31.3
28	Anapalle	28.0	30.5	66	Ootacamund	38.7	38.2
29	Bidhanagar	28.9	31.7	67	Tirupattur	39.0	58.1
30	Chidambaram	29.5	31.3	68	Chittoor	39.6	28.8
31	Narasimhapet	30.2	35.8	69	Bezwada	41.0	36.5
32	Kurnool	30.3	37.5	70	Ellore	41.3	47.5
33	Mannargudi	30.8	34.5	71	Tiruvannamalai	42.8	44.3
34	Erode	30.7	33.5	72	Periyakulam	43.6	49.3
35	Karur	30.7	31.2	73	Palni	44.8	51.5
36	Mangalore	31.0	33.3	74	Dindigul	47.0	55.2
37	Gummanur	31.4	36.5		Kodaikanal	48.2	49.1
38	Vaniyambadi	31.8	35.3				

ANNEXURE B.

I. Districts—Death-rate.

Serial No.	District.	Rate for year under report.	Rate for 5 years ending 1918.	Serial No.	District.	Rate for year under report.	Rate for 5 years ending 1918.
1	Nellore	16.0	21.0	14	Tinnevely	26.9	25.2
2	South Arcot	19.6	24.2	15	North Arcot	27.1	29.5
3	Anantapur	20.3	35.9		Presidency average ...	27.2	27.6
4	Ramanud	20.6	19.8	16	Salem	27.3	31.1
5	Cuddapah	21.2	30.0	17	Guntur	27.6	30.0
6	Coimbatore	21.5	26.1	18	Vizagapatnam (excluding agency).	29.0	28.9
7	Bellary	21.6	45.5	19	Godavari (do.)	29.4	28.2
8	Madura	22.1	23.7	20	Chingleput	31.7	30.9
9	Kurnool	22.5	38.6	21	The Nilgiris	35.0	33.0
10	Trichinopoly	23.9	25.1	22	Ganjama (excluding agency).	36.5	20.9
11	Chittoor	25.2	25.9	23	South Kanara	36.8	25.2
12	Kistna	25.2	29.2	24	Malabar	42.2	25.3
13	Tanjore	26.4	27.7				

II. Municipalities—Death-rate.

Serial No.	Municipality.	Rate in 1919.	Quin- quennial average.	Serial No.	Municipality.	Rate in 1919.	Quin- quennial average.
1	Adoni	16.3	43.6	39	Wajahpet	35.6	37.3
2	Bodinayakanur	18.3	23.0	40	Bellary	36.0	71.0
3	Villupuram	16.8	17.6	41	Salem	36.0	45.7
4	Bidhanagar	22.4	21.5	42	Palghat	36.4	34.1
5	Anantapur	23.2	38.7	43	Chidambaram	36.5	35.0
6	Tiruppur	23.3	22.0	44	Chingleput	37.2	36.2
7	Cuddalore	24.3	34.9	45	Miyavararam	37.2	37.6
8	Vellore	24.6	31.1	46	Tanjore	37.3	37.4
9	Tenali	24.7	30.7	47	Cojaveeram	37.4	40.1
10	Peddipparam	25.3	23.6	48	Coonoor	37.4	29.2
11	Ellore	27.5	30.7	49	Tinnevely	37.4	35.2
12	Vaniyambadi	28.2	37.3	50	Srirangam	37.4	34.4
13	Anapalle	28.3	31.4	51	Nellore	37.5	41.1
14	Mesulipattam	28.7	35.9	52	Madura	37.8	33.2
15	Kurnool	29.2	2.3	53	Virudupatti	38.0	23.6
16	Mannargudi	30.3	39.9	54	Coimbatore	38.3	33.7
17	Proddatur	30.3	60.1	55	Ongole	39.1	31.6
18	Tiruvallur	30.5	31.0	56	Periyakulam	39.3	35.2
19	Karur	30.9	34.4		Presidency average ...	39.3	37.8
20	Proddatur	31.1	23.7				
21	Gudivallam	31.2	31.3	57	Mangalore	39.4	29.1
22	Kuumbharam	31.2	32.7	58	Tirupattur	39.5	35.3
23	Narasimhapet	31.3	2.8	59	Tiruvannamalai	39.9	46.6
24	Srivilliputtur	32.0	29.7	60	Coonoor	40.0	31.9
25	Erode	32.6	38.3	61	Berhampur	41.9	29.0
26	Cuddapah	32.6	35.5	62	Ootacamund	42.3	36.3
27	Udumalpet	32.8	22.3	63	Chittoor	43.9	28.3
28	Kodaikanal	33.0	22.7	64	Parthasarathi	45.1	29.7
29	Nagapattinam	33.2	32.2	65	Coimbatore	45.4	51.8
30	Rajahmundry	33.3	32.5	66	Guntur	45.8	44.3
31	Trichinopoly	33.3	32.5	67	Cochin	46.7	34.3
32	Nandyal	33.8	50.4	68	Dindigul	51.3	43.1
33	Tallicherry	33.8	30.3	69	Tellicherry	52.6	35.5
34	Palamecottah	34.5	31.1	70	Madras	53.1	43.7
35	Chitacole	35.1	27.9	71	Calicut	59.4	33.1
36	Vizianagaram	35.1	35.0	72	Bezwada	62.3	44.7
37	Vizagapatnam	35.3	35.3	73	Palni	64.3	46.0
38	Dharmaparam	35.4	30.2	74	Tirupattur	64.6	67.2

ANNEXURE C.

I. Districts—Infantile mortality.

Serial No.	District.	Rate in 1919.	Average for 5 years ending 1918.	Difference between columns 3 and 4.	Serial No.	District.	Rate in 1919.	Average for 5 years ending 1918.	Difference between columns 3 and 4.
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
1	Cuddapah	128.6	167.7	-41.1	15	Presidency average	182.9	198.0	-51
2	Nellore	148.6	203.8	-57.2	16	Trichinopoly	193.3	195.8	-2.5
3	Ramanad	152.0	167.5	-14.9	17	Kistna	196.4	209.9	-13.5
4	Coimbatore	181.5	194.7	-30.2	18	North Arcot	198.1	188.3	+9.8
5	Kurnool	181.5	204.3	-39.8	19	Bellary	199.1	215.5	-19.4
6	Madras	168.6	175.2	-6.6	20	Tinnevely	199.2	201.0	-1.8
7	Anantapur	169.4	207.7	-38.3	21	Malabar	205.6	179.8	+25.8
8	Godavari	174.8	173.4	+1.4	22	Guntur	207.2	231.1	-23.9
9	Vizagapatnam	175.2	179.5	-4.3	23	South Kanara	208.5	182.6	+25.9
10	South Arcot	178.0	209.9	-31.9	24	Ganjum	211.4	189.4	+22.0
11	Chittoor	181.0	172.4	+8.6	25	Tanjore	214.8	220.0	-11.2
12	Salem	188.3	214.8	-26.5	26	The Nilgiris	227.2	229.6	-2.4
					27	Chingleput	221.9	238.0	+25.0

II. Municipalities—Infantile mortality.

Serial No.	Municipality.	Rate in 1919.	Average for 5 years ending 1918.	Difference between columns 3 and 4.	Serial No.	Municipality.	Rate in 1919.	Average for 5 years ending 1918.	Difference between columns 3 and 4.
(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
1	Villupuram	75.2	...	...	39	Chicacole	222.8	198.5	+24.3
2	Adoni	104.3	241.1	-136.8	40	Palamcottah	225.2	227.5	-2.3
3	Peddapuram	110.0	170.3	-54.3	41	Conjeevaram	225.6	258.4	-42.8
4	Anantapur	118.9	231.5	-114.6	42	Chittoor	229.7	220.6	+9.1
5	Rajahmundry	128.7	183.9	-55.2	43	Trichinopoly	230.9	251.0	-20.1
6	Bodinayakkannur	133.2	145.8	-12.6	44	Narasaraopet	231.1	239.1	+1.0
7	Dharmaparam	136.6	214.8	-78.2	45	Chingleput	233.3	229.8	+3.5
8	Vellore	141.9	180.4	-38.5	46	Nellore	233.8	229.5	+4.3
9	Nandyal	153.0	221.1	-68.1	47	Tinnevely	233.9	229.5	+4.4
10	Cannanore	155.1	147.5	+7.6	48	Tiruvallur	234.5	233.5	+1.0
11	Proddatur	157.2	191.4	-34.2	49	Dindigul	235.1	279.0	-43.9
12	Bhimipatam	167.3	167.1	+0.2	50	Tiruvannamalai	239.6	258.8	-19.2
13	Cuddalore	169.8	288.1	-118.3	51	Karur	240.0	220.3	+19.7
14	Cuddapah	173.3	200.4	-27.1	52	Tiruppur	240.4	206.9	+33.5
15	Vaniyambadi	177.5	176.6	+0.9	53	Kumbakonam	244.0	242.8	+1.2
16	Tellicherry	179.3	151.5	+27.8	54	Periyakulam	245.1	239.8	+5.3
17	Cochin	180.0	187.5	-7.5	55	Mylavaram	246.0	246.0	0.0
18	Srivilliputtur	180.6	183.7	-3.1	56	Presidency average	246.2	252.0	-5.8
19	Anakapalle	186.6	204.2	-17.6	57	Ootacamund	248.3	247.8	+0.5
20	Ellore	191.3	274.7	-83.4	58	Tanjore	248.9	273.2	-24.3
21	Godiyattam	192.9	204.9	-12.0	59	Bellary	249.2	319.3	-70.1
22	Hospet	194.3	237.4	-43.1	60	Madras	251.3	236.9	+14.4
23	Palghat	195.9	191.2	+4.7	61	Chidambaram	257.0	287.0	-30.0
24	Walajpet	198.4	246.9	-48.5	62	Cannanore	259.8	235.3	+24.5
25	Tenali	200.4	265.7	-65.3	63	Tirupathi	263.2	241.8	+21.4
26	Salem	202.1	229.5	-27.4	64	Negapatam	264.5	237.6	+26.9
27	Coonoor	204.0	225.2	-21.2	65	Vindupatti	269.4	266.0	+3.4
28	Masulipatam	204.9	305.6	-100.7	66	Chidambaram	271.6	221.6	+49.0
29	Mannargudi	204.9	233.4	-28.5	67	Onole	278.2	232.7	+45.5
30	Parthimedi	209.4	220.8	-11.4	68	Srirangam	280.1	328.6	-48.5
31	Mangalore	213.5	172.0	+41.5	69	Coimbatore	281.9	221.4	+60.5
32	Kurnool	215.7	231.2	-15.5	70	Tirupattur	283.1	231.6	+51.5
33	Vizianagaram	216.3	249.2	-32.9	71	Bejjampur	301.3	242.8	+58.5
34	Calicut	217.0	182.4	+34.6	72	Guntur	303.1	390.4	-87.3
35	Tuticorin	219.3	227.2	-7.9	73	Madras	322.1	302.1	+20.0
36	Erode	220.3	228.5	-8.2	74	Vizagapatam	347.2	264.2	+83.0
37	Udamalpet	220.5	410.0	-189.5		Bejjampur	374.6	357.8	+16.8
38	Kodakinal	221.4	215.3	+6.1					

ANNEXURE D.

I. Districts—Incidence of Mortality from Fevers.

Serial No.	District.	Rate for five years ending 1918.	For 1919.	Serial No.	District.	Rate for five years ending 1918.	For 1919.
(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
1	Tanjore	4.9	5.1	14	Nellore	10.5	8.0
2	Tinnevely	5.0	6.0	15	Kistna	11.2	11.5
3	Madras	5.6	6.5	16	Anantapur	11.5	3.1
4	South Arcot	5.9	6.6	17	Salema	11.5	10.1
5	Coimbatore	6.2	5.1	18	The Nilgiris	12.1	13.0
6	Chingleput	6.5	5.5	19	Godavari (excludes Agency)	13.1	10.7
7	Madras	6.9	5.7	20	Guntur	14.7	13.1
8	North Arcot	7.1	5.0	21	Bellary	15.7	4.8
9	Ramanad	7.2	8.8	22	Ganjum (excludes agency)	15.9	25.7
10	Trichinopoly	7.6	6.3	23	Cuddapah	17.5	10.5
11	Malabar	9.1	15.1	24	Vizagapatam (excludes Agency)	24.6	22.0
12	Chittoor	9.4	6.4	25	Kurnool	25.9	14.1
13	South Kanara	9.7	9.9		Presidency average	10.5	10.1

II. Municipalities—Incidence of Mortality from Fevers.

Serial No.	Municipality.	Rate in 1919.	Serial No.	Municipality.	Rate in 1919.
(1)	(2)	(3)	(1)	(2)	(3)
1	Vaniyambadi	0.2	39	Ellore	6.9
2	Coonoor	1.1	40	Godiyattam	6.8
3	Cuddalore	1.1		Presidency Average	6.9
4	Palni	1.3	41	Masulipatam	7.2
5	Conjeevaram	1.6	42	Mannargudi	7.2
6	Cannanore	2.0	43	Vizagapatam	7.2
7	Bhimipatam	2.1	44	Karur	7.6
8	Mangalore	2.2	45	Coimbatore	7.8
9	Tiruppur	2.4	46	Tellicherry	7.9
10	Dharmaparam	2.6	47	Tinnevely	7.9
11	Trichinopoly	2.6	48	Calicut	8.0
12	Vellore	3.0	49	Srivilliputtur	8.0
13	Adoni	3.4	50	Rajahmundry	8.5
14	Bodinayakkannur	3.5	51	Palamcottah	8.5
15	Bellary	3.6	52	Kodakinal	8.6
16	Chittoor	3.7	53	Peddapuram	8.7
17	Dindigul	4.2	54	Periyakulam	8.8
18	Udamalpet	4.8	55	Tuticorin	8.8
19	Hospet	5.0	56	Proddatur	8.9
20	Chingleput	5.1	57	Kumbakonam	9.1
21	Cuddapah	5.1	58	Ootacamund	9.4
22	Cochin	5.1	59	Anakapalle	9.8
23	Chidambaram	5.1	60	Bejjampur	10.1
24	Mylavaram	5.1	61	Palghat	10.4
25	Nellore	5.4	62	Vizianagaram	10.8
26	Srirangam	5.4	63	Madras	10.9
27	Salema	5.5	64	Bejjampur	11.1
28	Tiruvallur	6.0	65	Guntur	11.2
29	Tenali	6.2	66	Kurnool	11.5
30	Walajpet	6.2	67	Onole	12.9
31	Tanjore	6.2	68	Tirupattur	13.3
32	Anantapur	6.4	69	Cannanore	13.4
33	Madras	6.4	70	Vindupatti	12.8
34	Negapatam	6.4	71	Chicacole	13.1
35	Tirupathi	6.5	72	Narasaraopet	15.6
36	Tiruvannamalai	6.5	73	Parthimedi	17.0
37	Villupuram	6.5	74	Nandyal	17.0
38	Erode	6.9			

ANNEXURE E.

I. Districts—Incidence of Mortality from Dysentery and Diarrhoea.

Serial No.	District.	Rate for five years ending 1918.	For 1919.	Serial No.	District.	Rate for five years ending 1918.	For 1919.
1	Viragapatam (excluding Agency)	0.7	0.8	15	South Arcot	1.5	1.4
2	Cuddapah	0.8	0.6	16	Chittoor	1.6	1.5
3	Kurnool	0.8	0.6	17	Kistna	1.7	0.7
4	Guntur	1.0	0.7	18	Bellary	2.1	1.2
5	Nellore	1.0	0.4	19	South Kanara	2.4	4.7
6	Ramanid	1.0	0.8	20	Malabar	2.8	5.6
7	Ganjam (excluding Agency)	1.1	1.5	21	Chingleput	2.9	3.2
8	Anantapur	1.2	0.7	22	Coimbatore	3.0	2.6
9	Godavari (excluding Agency)	1.2	0.6	23	North Arcot	3.1	2.4
10	Tanjore	1.2	1.0	24	The Nilgiris	5.7	5.0
11	Tinnevely	1.2	1.4	25	Madras	9.0	11.4
12	Trichinopoly	1.2	1.2				
13	Madras	1.4	1.4				
14	Salem	1.5	1.2		Presidency average	1.7	1.9

II. Municipalities—Incidence of Mortality from Dysentery and Diarrhoea.

Serial No.	Municipality.	Rate in 1919.	Serial No.	Municipality.	Rate in 1919.
1	Proddattor	0.3	39	Karur	3.4
2	Addai	0.4	40	Bellary	3.7
3	Villupuram	0.8	41	Talicherry	3.8
4	Rajamahendry	1.1	42	Dharwad	3.9
5	Nandyal	1.1	43	Becharapur	3.9
6	Masulipatam	1.3	44	Peddapattam	4.0
7	Anantapur	1.4	45	Nagapattam	4.1
8	Guntur	1.4	46	Coimbatore	4.2
9	Kurnool	1.5	47	Bezwada	4.2
10	Bedinayakhanur	1.5	48	Cannanore	4.6
11	Tiruppur	1.9	49	Hospet	4.8
12	Tenali	1.9	50	Walajpet	4.8
13	Ellore	1.9	51	Gadipattam	5.0
14	Chidambaram	2.0	52	Coimbatore	5.1
15	Vellore	2.2	53	Coimbatore	5.2
16	Vijayambadi	2.2	54	Virudupatti	5.4
17	Srivilliputhur	2.2		Presidency average	5.4
18	Mannargudi	2.2	55	Tanjore	5.7
19	Kudakottam	2.3	56	Talicherry	6.0
20	Ongole	2.4	57	Mangalore	6.1
21	Majevaram	2.4	58	Chitral	6.2
22	Narasaraopet	2.5	59	Erode	6.3
23	Kodakal	2.8	60	Periyakulam	6.4
24	Nellore	2.8	61	Bhimipattam	6.4
25	Cuddalore	2.9	62	Calicut	6.5
26	Cannanore	3.0	63	Palai	7.0
27	Tiruvallur	3.0	64	Tiruvannamalai	7.1
28	Madras	3.1	65	Tirupattur	7.1
29	Salem	3.1	66	Tirupattur	7.4
30	Srirangam	3.1	67	Palakkudi	8.1
31	Palghat	3.2	68	Palamcottah	8.2
32	Cuddapah	3.4	69	Dindigul	9.2
33	Ootacamund	3.4	70	Chingleput	9.5
34	Trichinopoly	3.4	71	Cachin	9.8
35	Tinnevely	3.5	72	Viragapatam	10.0
36	Anakapalle	3.5	73	Vizianagaram	10.5
37	Chittoor	3.5	74	Madras	11.4
38	Udumalpet	3.6			

ANNEXURE F.

I. Districts—Incidence of Mortality from Respiratory diseases.

Serial No.	District.	Rate for five years ending 1918.	For 1919.	Serial No.	District.	Rate for five years ending 1918.	For 1919.
1	Ganjam (excluding Agency)	0.3	0.4	15	Kurnool	1.4	0.9
2	Nellore	0.4	0.4	16	Malabar	1.4	1.6
3	Viragapatam (excluding Agency)	0.4	0.4	17	Chittoor	1.5	1.4
4	Tanjore	0.5	0.6	18	Coimbatore	1.5	1.5
5	Tinnevely	0.5	0.6	19	Godavari (excluding Agency)	1.6	1.3
6	Trichinopoly	0.6	0.6	20	North Arcot	1.9	1.2
7	Ramanid	0.6	0.9	21	Bellary	1.7	1.1
8	South Arcot	0.6	0.7	22	Anantapur	2.3	1.3
9	Madras	0.9	0.6	23	Kistna	2.3	2.9
10	Salem	0.9	0.8	24	The Nilgiris	4.5	4.3
11	South Kanara	1.0	1.2	25	Madras	8.7	10.2
12	Chingleput	1.2	1.4				
13	Guntur	1.2	1.3		Presidency average	1.3	1.2
14	Cuddapah	1.4	0.8				

II. Municipalities—Incidence of Mortality from Respiratory diseases.

Serial No.	Municipality.	Rate in 1919.	Serial No.	Municipality.	Rate in 1919.
1	Anantapur	1.7	39	Madras	1.7
2	Addai	1.7	40	Karur	1.7
3	Hospet	1.8	41	Kumbakonam	1.8
4	Chingleput	1.8	42	Vizianagaram	1.8
5	Proddattor	2.1	43	Talicherry	2.1
6	Chitral	2.2	44	Erode	2.2
7	Ellore	2.3	45	Trichinopoly	2.3
8	Nandyal	2.4	46	Palakkudi	2.4
9	Kodakal	2.4	47	Kurnool	2.4
10	Palghat	2.5	48	Periyakulam	2.5
11	Nellore	2.5	49	Calicut	2.5
12	Majevaram	2.6	50	Srivilliputhur	2.6
13	Udumalpet	2.6	51	Cuddalore	2.6
14	Tiruppur	2.6	52	Tirupattur	2.6
15	Tiruvannamalai	2.6	53	Mangalore	2.6
16	Virudupatti	2.6	54	Becharapur	2.6
17	Villupuram	2.6	55	Palamcottah	2.6
18	Ongole	2.6	56	Cannanore	2.6
19	Palai	2.6	57	Tenali	2.6
20	Gadipattam	2.6	58	Tanjore	2.6
21	Rajamahendry	2.6		Presidency average	2.6
22	Guntur	2.6		Viragapatam	2.6
23	Bedinayakhanur	2.6		Cannanore	2.6
24	Dindigul	2.6		Vijayambadi	2.6
25	Tiruvallur	2.6		Narasaraopet	2.6
26	Peddapattam	2.6		Bellary	2.6
27	Salem	2.6		Cuddalore	2.6
28	Masulipatam	2.6		Chittoor	2.6
29	Nagapattam	2.6		Bezwada	2.6
30	Bhimipattam	2.6		Srirangam	2.6
31	Anakapalle	2.6		Talicherry	2.6
32	Walajpet	2.6		Coimbatore	2.6
33	Chidambaram	2.6		Cannanore	2.6
34	Mannargudi	2.6		Tirupattur	2.6
35	Tinnevely	2.6		Ootacamund	2.6
36	Chingleput	2.6		Cachin	2.6
37	Coimbatore	2.6		Madras	2.6
38	Vellore	2.6			