

Report on health conditions

in Madras State

1960

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REPORT ON THE HEALTH CONDITIONS IN MADRAS STATE, 1960.

CHAPTER I—VITAL STATISTICS.

The vital statistics recorded during 1960 reveal that the improved health conditions of the people were maintained and that in some directions further progress was also made. The birth rate has been steady, while the general death rate and the infant mortality rate indicate a down-ward trend over the last decade. Compared with 1959, there was a decrease in birth rate; the death rate was about the same; mortality from cholera, smallpox, malaria and respiratory diseases has decreased; the infant mortality rate was about the same. The maternal mortality rate has further decreased and is the lowest on record.

POPULATION.

In accordance with the Pataskar award on the allocation of border areas between the Madras State and the Andhra Pradesh, 148 villages in Chingleput district and three villages in Salem district in Madras State were transferred to the Andhra Pradesh and 286 villages were added to Chingleput district and 83 villages to North Arcot district from Andhra Pradesh. As a result of this, the net addition to population of this State as per 1951 census is 143,918, bringing the total population of the Madras State as at present organised to 30,118,854 as per 1951 census. The present extent of the State is 50,132 square miles. In the areas transferred, there was no municipal town. During the year, the towns of Ramanathapuram, Arcot and Ranipet which were constituted as municipalities in 1959, were included as municipal areas in 1960 for purposes of vital statistics. Kodaikanal municipal town was converted into a Township and Kurichi municipality was down-graded as a panchayat on 1st October 1960. However the vital statistics of these two towns for the whole year of 1960 were included under municipal areas. Thus there were 67 municipal towns including Madras City. The mid-year populations for the State, urban and rural areas, municipal and census town areas were estimated as usual on arithmetic progression method. These populations were adopted in calculating the vital statistics rates in this report unless otherwise stated. The 1951 census and 1960 mid-year populations for the various areas in the State are given below :—

Area.	Population as per 1951 census.	Estimated mid-year population for 1960.
(1)	(2)	(3)
State	30,118,854	33,729,000
Rural	22,904,424	24,744,000
Urban	7,214,430	8,986,000
Municipal Towns	4,862,740	6,230,000
Census Towns	2,351,690	2,756,000

The estimate of population arrived at by excess of registered births over deaths during the period 1951 to 1960 excluding migration is 34,048,575, as

against the provisional census figure of 33,650,917 as per 1961 census. The two figures will not differ by more than two to three per cent even allowing for in complete coverage in compilation of births and deaths.

REGISTRATION OF BIRTHS AND DEATHS.

Registration of births and deaths was compulsory in all the villages in the districts of Chingleput, South Arcot, Ramanathapuram and Coimbatore. A few backward villages and erstwhile zamindari and Inam villages in the other districts were excluded from the operation of the Act III of 1899. Government have since extended the Act to all the villages in the other districts except 40 villages in all in the districts of Tirunelveli, Thanjavur, Tiruchirappalli and the Nilgiris during the year. In the rural areas of Kanyakumari district and Shencottah taluk in Tirunelveli district, registration of vital events is compulsory under the Travancore-Cochin Registration of Births and Deaths Act, 1954.

Five panchayats have agreed to take up the registration of births and deaths. The provisions of the Madras District Municipalities Act relating to registration of births and deaths have been extended to three other panchayats. Five panchayats have not yet enforced registration of births and deaths although the provisions have been extended to them. In all, 10 panchayats have undertaken the work of birth and death registration.

In the three Township areas, registration of births and deaths is compulsory and the Health Inspectors of the areas have been appointed as birth and death registrars. Registration is compulsory in all municipal areas including the municipal towns in Kanyakumari district and Shencottah municipality. In the latter areas, rules issued under Travancore-Cochin Municipal Act, are however still in force.

The District Health Officers continue to report that the signature of informants of births and deaths and that the names of children are not entered in several cases in the registers. These are serious defects and detract the legal value of the vital records. The registrars (village headmen) should be advised to see that these particulars are invariably entered in the registers. It is also reported that the Tahsildars do not take sufficient interest in administering the provisions of the Act III of 1899. Out of 9,306 unregistered vital events (including those pending at the end of 1959) reported to the Tahsildars for prosecution, no prosecution was sanctioned in respect of 1,691 cases and 5,032 were still pending action at the end of 1960. Thus no action was taken on 72 per cent of cases.

It was found that several deaths escaped registration even in municipal areas. If the relevant provisions relating to burial and burning grounds in the Madras District Municipalities Act were strictly enforced, it should be possible to ensure cent per cent registration of deaths. As per section 282 of the Act, the Executive Authority should appoint an officer to whom the persons having control of a place for disposing of the dead shall give information. It is reported that only 12 municipalities implement these provisions. The municipalities were therefore requested to see that all burial and burning grounds in their areas are registered, that officers may be nominated to whom particulars about corpses disposed of are reported by the owners of the burial and burning grounds. It is hoped that municipalities will enforce these provisions strictly.

It is one of the routine duties of the Health Inspectors and the health staff to detect unregistered births and deaths and bring them on record. The number of unregistered events detected is shown below :—

Areas.	Number detected.		Percentage to total number registered.	
	Births.	Deaths.	Births.	Deaths.
(1)	(2)	(3)	(4)	(5)
Municipal areas ..	17,700	8,083	7.1	8.6
Non-municipal areas ..	8,887	1,586	1.4	0.5
Total ..	26,587	9,669	3.0	2.4

The numbers of detected births and deaths were more than those detected in 1959. These would have been still more if off-season was declared for vaccinators when they do intense house to house checking. In order to ensure complete registration of births and deaths, the importance of registering them to the individual and to the community was explained by the health staff through 8,784 talks and lectures and distributing 6,054 pamphlets on the subject. Another noteworthy point is that detection of deaths is more than that of births in municipal areas.

In order to improve the completeness of registration of births and deaths in rural areas and determine the actual birth and death rates, a special Health Inspector was appointed for 39 villages with a population of 62,833 in the Health Unit at Poonamallee to check up intensively the registration work. He visited each village three or four times in 1960 and carried out house to house enquiry about the births and deaths that occurred in the area. One hundred and fifty-seven unregistered births and 172 unregistered deaths were detected in 1960 as against 123 and 169 respectively in 1959. Here also, the unregistered deaths detected are more than unregistered births. Hence, the need for vigilance regarding registration of deaths is equally great as in the case of births. The birth and death rates for the Health Unit area are 41.6 and 17.8 in 1960 as against corrected birth and death rates of 25.0 and 12.4 for rural areas in the State. Even allowing for non-resident births occurring in the area, the rates are high in the special area indicating that registration is poor in other rural areas.

COMPILATION OF VITAL STATISTICS.

The system of compilation of vital statistics for the State remained unchanged. The flow of monthly birth and death returns relating to villages continued to be unsatisfactory. The number of returns due, the number received and the number not received for the year in respect of each district are shown in Annexure A. The percentage of returns not received to total due was 5.8 as against 5.4, 8.3 and 6.8 in 1959, 1958 and 1957 respectively. This shows that the birth and death registers do not comply with the statutory provision whereby they are required to submit the returns to the Tahsildars by the 3rd of the following month. It also shows that the Tahsildars are not taking interest in this behalf. The Collectors have been repeatedly reminded and they in turn have circularised the Tahsildars to forward all the returns promptly. These instructions or orders of the Collector have not improved the prompt submission of the returns. It is difficult to get the vital events registered. But it is a pity that even after registration, the coverage

of compilation of vital statistics should be incomplete due to the default of officers concerned. This could be remedied if serious view is taken by the Government.

All the birth and death returns for Municipal towns and all the returns for Census towns except the death returns for one town have been received.

BIRTHS.

As pointed out in the foregoing paragraphs, the vital statistics compiled are not accurate for two reasons, viz., under registration and incomplete coverage in compilation of recorded events in rural areas. It is not possible to make correction for under registration as no estimate of under-registration has been computed. In respect of the other source of error, the population for which the returns have not been received may be determined and actual recorded rates computed. The labour involved in such a computation is so heavy that it is not worth the time spent. Moreover, there is no adequate staff. Hence, a correction of birth and death rates compiled on a pro rata basis has been applied. These estimates may not differ from the actual rates significantly.

The recorded births and birth rates and the corrected birth rates for the period 1950 to 1960 in the State are as hereunder :—

Year.	Number of recorded births.	Recorded birth-rate.	Corrected birth-rate.
(1)	(2)	(3)	(4)
1950	862,310	29.0	29.3
1951	777,233	25.7	26.6
1952	837,018	27.5	28.1
1953	777,312	25.2	25.6
1954	820,974	26.3	26.9
1955	981,340	31.0	31.6
1956	891,373	27.8	30.1
1957	866,642	26.7	28.2
1958	885,061	27.0	28.8
1959	945,791	28.5	29.7
1960	900,069	26.7	27.8

The corrected birth rates do not show a definite upward or downward trend. They hover about an average rate of 28.43, as will be evident from the straight line fitted to the observed corrected rates (*vide* Chart No. 1). The equation to the straight line fitted is $y = 0.14 X + 28.43$, the origin being 1955.

There has been a reduction in the number of recorded births from 945,791 with a birth rate of 28.50 in 1959 to 900,069 with a rate of 26.69 in 1960. Even after correction for non-receipt of all birth and death returns, the corrected birth rate has decreased from 29.7 in 1959 to 27.8 in 1960. The decline is observed in all the areas of the State as shown below :—

Area.	Recorded birth rate.		Corrected birth rate.	
	1959.	1960.	1959.	1960.
(1)	(2)	(3)	(4)	(5)
State	28.5	26.7	29.7	27.8
Rural	25.9	23.6	27.4	25.0
Urban	35.9	35.2	35.9	35.2
Municipal Towns	40.5	40.2	40.5	40.2
Census Towns	25.9	24.1	25.9	24.1

The reduction in municipal areas is however negligible.

The numbers of boys and girls born were 466,068 and 434,001, giving a ratio of 107:100, the same as in 1959. The birth rate was in excess of death rate by 14.58 in 1960.

In annexure B the number of births by sex recorded in rural and urban areas in each month are given. It will be seen that minimum number of births occurred in the first quarter and the maximum in the last quarter.

BIRTHS IN DISTRICTS.

The births registered in each district by sex and the recorded birth rates are given in statement I of the appendix. As all the birth and death returns have not been received, the birth rates estimated on *pro rata* basis are given in annexure I. The rates are less than those for 1959 in respect of all districts except Ramanathapuram where the excess is small and vary from 23.2 in Salem district to 31.7 in North Arcot district as in 1959. The distribution of the birth rates corrected for non-receipt of birth and death returns is shown below :—

Corrected birth rate.							Number of districts.	
(1)							1959.	1960.
							(2)	(3)
20 and under 25	..	..	..	..	..	..	1	?
25 do. 30	..	..	..	..	..	..	5	8
30 do. 35	..	..	..	..	..	..	5	2
35 do. 40	..	..	..	..	..	..	1	..
Total ..							12	12

The birth rate was in excess of death rate in all the districts, the excess ranging from 20.6 in the Nilgiris district to 12.8 in South Arcot district.

BIRTHS IN MUNICIPAL TOWNS.

All the birth and death returns for the year have been received and no correction for incomplete coverage in compilation is necessary. The number of registered births of 250,317 (128,376 boys and 121,941 girls) was in excess by 7,143 births as compared with 1959. This is due to the increase in the number of municipal towns by three. The birth rate was however 40.2 as against 40.5 in 1959. The towns distributed according to birth rates are as hereunder :—

Birth rate.							Number of municipal towns.	
(1)							1959.	1960.
							(2)	(3)
10—19	..	..	..	..	..	..	4	3
20—29	..	..	..	..	..	..	5	8
30—39	..	..	..	..	..	..	20	25
40—50	..	..	..	..	..	..	23	22
50 and above	..	..	..	..	..	..	12	9
Total ..							64	67

The three towns that returned low birth rates were Tirunelveli (11.7), Melapalayam (16.1) and Kurichi (16.6). The low rates in the first two

towns are not real. Most of the births relating to these towns occur in bordering towns of Madras and Palayamkottai respectively where maternity facilities are available. Kurichi did not employ a separate birth and death registrar and it has also ceased to be a municipality now. The low rate may therefore be due to defective registration. The towns that recorded high birth rates were Palayamkottai (63.1), Chingleput (62.9), Mannargudi (59.2) and Coimbatore (57.9). The high rates are mainly due to non-resident births occurring in the towns.

BIRTHS IN CENSUS TOWNS.

There were 66,297 births (34,571 boys and 31,726 girls) in all the Census towns each with a population of 5,000 and above giving a birth rate of 24.06 as against 25.87 in 1959. All the birth and death returns were received and no correction for incomplete coverage is necessary. There was thus a small decrease in the birth rate as compared with 1959. The distribution of recorded birth rates among the census towns is as follows:—

Birth rates.	Number of census towns.	
	1959.	1960.
(1)	(2)	(3)
Less than 10	13	15
10 and less than 20	51	57
20 and less than 30	66	69
30 and less than 40	43	32
40 and less than 50	20	16
50 and above	11	12
Total ..	204	201 *

* Three towns were constituted as municipalities on 1st October 1959.

More than a third of the Census towns have recorded birth rates of less than 20. This indicates that registration of births is poor in all panchayat areas also. Only very few towns with a population of 10,000 and above have taken up the work of registration of births and deaths and appointed a separate registrar-cum-vaccinator. In the other towns the village headmen continue to be registrars. As the jurisdiction in these big towns is large, the headmen may not be in the knowledge of all vital occurrences therein and events may escape registration.

STILL-BIRTHS.

The number of registered still-births, still-birth rate per 1,000 of live and still-births for different areas in the State for 1960 as compared with 1959 are given in the following statement:—

Area.	Still-births.			
	1959.		1960.	
	Number.	Rate.	Number.	Rate.
(1)	(2)	(3)	(4)	(5)
State	15,403	16.0	14,506	15.9
Rural	2,992	4.7	2,228	3.8
Urban	12,411	37.9	12,278	37.3
Municipal Towns ..	11,106	43.7	10,965	42.0
Census Towns ..	1,305	17.8	1,313	19.4

The still-birth rate has decreased in rural areas, while the variations in other areas are not large. An examination of the above figures will show that the still-birth rate in rural areas is very low. This is not probably true, as the maternity service in rural areas is still inadequate compared to municipal areas. It is likely that many still-births are not registered due to ignorance of people of their obligation to report still-births also.

The still-birth by sex registered in municipal and non-municipal areas in each district and in each district as a whole are furnished in annexure D. In statement I (a) of the appendix the still-births by sex registered in each municipal town according to community and the still-birth rate are given. Palayamkottai (97.2), Chingleput (83.6) and Mannargudi (80.7) returned high still-birth rates. This is probably due to several non-residential mothers who had not pre-natal care go to the hospitals in the towns for delivery at a late stage. Five municipal towns reported less than five still-births in the year.

DEATHS.

The registered number of deaths, death rates and the death rates corrected for non-receipt of birth and death returns for the year 1950 to 1960 are tabulated below:—

Year.	Number of registered deaths.		Registered death-rates.		Corrected death-rates.	
	(1)	(2)	(3)	(4)	(5)	(6)
1950	..	536,653	19.7	19.9	19.9	19.9
1951	..	514,549	17.1	17.6	17.6	17.6
1952	..	488,400	16.0	16.4	16.4	16.4
1953	..	533,434	17.2	17.6	17.6	17.6
1954	..	437,386	14.0	14.4	14.4	14.4
1955	..	453,185	14.3	14.6	14.6	14.6
1956	..	435,185	13.6	14.5	14.5	14.5
1957	..	460,822	14.2	14.9	14.9	14.9
1958	..	429,321	13.1	14.0	14.0	14.0
1959	..	395,749	11.9	12.5	12.5	12.5
1960	..	408,461	12.1	12.7	12.7	12.7

It is apparent from the above statement that there is a definite reduction in the death rate over the last eleven years. After a decline from 19.9 in 1950 to 14.4 in 1954, the death rate was steady for a period of five years and has further decreased in 1959 and 1960. A straight line fitted to the corrected rates shows a downward trend, the equation to straight line being $y = -0.63x + 15.37$, with 1955 as origin, vide Chapter I.

There were 408,461 registered deaths (205,026 males and 203,435 females) in 1960 as against 395,749 in 1959, the recorded death rates being 12.11 and 11.93 respectively. The death rates corrected for non-receipt of birth and death returns are 12.5 for 1959 and 12.7 for 1960, the increase being 0.2 only. The ratio of male to female deaths was 101:100.

The death rates in rural and urban areas in the State for 1959 and 1960 are as follows:—

Areas.	Recorded death-rate.		Corrected death-rate.	
	1959.		1960.	
	(2)	(3)	(4)	(5)
(1)	(2)	(3)	(4)	(5)
State	11.9	12.1	12.5	12.7
Rural	11.4	11.7	12.1	12.4
Urban	13.4	13.2	13.4	13.2
Municipal Towns ..	15.5	15.1	15.5	15.1
.. .. .	8.9	8.8	8.9	8.8

The death rate has increased in rural areas, but has decreased in urban areas (municipal and Census town areas). The variations however are small. The death rate for municipal areas is the highest.

The number of registered deaths by sex in rural and urban areas in each month are tabulated in annexure C. As in the previous years, maximum number of deaths occurred in the last quarter and the minimum in the second quarter.

DEATHS IN DISTRICTS.

The registered deaths by sex and the death rates in each district are given in Statement II of the Appendix. The death rate for each district corrected for non-receipt of the birth and death returns is furnished in annexure I. Compared with the average rates for the previous five years, the corrected death rates in all the districts in 1960 are less. The rate varies from 8.0 in the Nilgiris to 15.5 in North Arcot and Tirunelveli districts. The distribution of death rates among the districts is as shown below :—

Death rate.	Number of districts.	
	1959.	1960.
Less than 10	2	3
10 and less than 15	10	7
15 and less than 20	..	2
Total ..	12	12

DEATHS IN MUNICIPAL TOWNS.

The death rates in municipal areas continued to decline from 22.5 in 1953 to 15.1 in 1960. There were 94,125 deaths (48,053 males and 46,072 females) in all the municipal towns in 1960 representing a death rate of 15.11 as compared with 15.50 in 1959. The death rates for the individual municipalities are given in Statement VI. The frequency of death rates in municipalities is shown in the following statement :—

Death rates.	Number of municipal towns.	
	1959.	1960.
Less than 10	17	15
10 and less than 15	21	30
15 and less than 20	22	19
20 and less than 25	4	3
Total ..	64	67

The municipal towns of Kurichi (5.3), Arkonam and Rasipuram (7.0 each), Melapalayam (7.1) and Cumbum (7.4) registered low death rates as in the previous two years, evidently due to under registration. High death rates were recorded in Palayamkottai (20.3), Periyakulam (22.4) and Vellore (22.6).

DEATHS IN CENSUS TOWNS.

In census town areas, 24,361 deaths (12,415 males and 11,946 females) were recorded in 1960 giving a death rate of 8.84 as compared with 8.89 in 1959. The distribution of death rates among the census towns is tabulated below :—

Death rates.	Number of census towns.	
	1959.	1960.
Less than 10	118	119
10 and less than 15	60	55
15 and less than 20	19	15
20 and less than 25	5	7
25 and less than 30	1	3
30 and above	1	2
Total ..	204	201

The low death rates of less than 10 in 119 towns are mainly due to under registration. As in 1959, high death rates were returned from Rameswaram (30.7) and Eraniel (33.7). The high death rate in Eraniel is due to non-resident deaths occurring in the hospital in the town and that in Rameswaram due to high death rate among the large number of old people in the town.

DEATHS BY AGES.

To calculate age specific death rates, populations by the age groups are necessary. But these are available for only a 10 per cent sample of the population. Hence, estimates of populations by age groups were computed by distributing the mid-year population of 1960 in the same ratio as in the sample population. The deaths by ages are compiled in Statement IV of the appendix. The age specific death rates on these estimated populations are tabulated below :—

Age groups.	Recorded deaths.			
	1959.		1960.	
	Number.	Death rate.	Number.	Death rate.
(1)	(2)	(3)	(4)	(5)
Under one year	86,151	91.1*	82,439	91.6*
1—5 years	74,558	23.2	83,136	25.4
5—10 „	13,737	3.4	15,411	3.8
10—15 „	7,514	1.8	7,189	1.7
15—20 „	10,562	3.4	9,738	3.1
20—30 „	22,199	4.3	22,057	4.2
30—40 „	26,335	5.1	22,578	4.8
40—50 „	25,907	7.2	25,501	7.0
50—60 „	27,774	11.3	29,184	11.7
60 years and above	104,012	43.2	111,228	50.7
Total ..	395,749	11.9	408,461	13.1

* Per 1,000 live-births.

The age specific mortality rates in 1960 followed the usual pattern, the rate being the lowest in the age group 10—15 years. The mortality under 1 year and 60 years and above account for about 47 per cent of the total deaths. Compared with 1959, the age specific death rates are less in the age groups 10 to 50 years and more in the other age groups.

DEATHS BY CAUSES.

In rural areas the causes of deaths are determined by village headmen. Even in municipal areas, the Registrars who are qualified Sanitary Inspectors make enquiries and decide the causes of deaths. In cases attended to by doctors, he obtains the cause of death from them. An attempt will be made to get a certificate of death from doctors who last attended the deceased and compile such data separately. The causes of deaths as recorded are therefore not entirely reliable. However, the comparative mortality from the specific disease or groups of diseases and the mortality rates for 1959 and 1960 are extracted below :—

Cause of death. (1)	Number of deaths.		Death rate.	
	1959. (2)	1960. (3)	1959. (4)	1960. (5)
Cholera	206	20	0.01	*
Smallpox	2,225	1,744	0.07	0.05
Plague	7	14	*	*
Malaria	732	637	0.02	0.02
Fevers other than Malaria	57,572	59,982	1.73	1.78
Dysentery and Diarrhoea	29,033	31,739	0.87	0.94
Respiratory diseases	40,856	40,612	1.23	1.20
Deaths from child birth	3,742	3,165	3.9†	3.5†
Suicides	2,316	2,253	0.1	0.1
Wounds and accidents	3,272	3,218	0.1	0.1
Killed by wild animals and snake bites	833	942	0.02	0.03
Hydrophobia	355	246	0.01	0.01
Other causes	254,600	263,889	7.7	7.8
Total ..	395,749	408,461	11.9	12.1

* Less than 0.01.

† Rate per 1,000 live and still births.

There has been a reduction in the deaths from all known causes except the groups—' fevers other than malaria ' and ' dysentery and diarrhoea ' and persons killed by snake-bites and wild animals. The increase in the mortality from the latter diseases was however not large. The three epidemic diseases (cholera, smallpox and plague) were responsible for only 0.4 per cent of total deaths. Malaria has ceased to be a serious problem. Deaths from " all other causes " accounted for 64.6 per cent of deaths from all causes. Unless the specific causes responsible for such a large percentage are known, it may not be possible to programme health measures. In the case of municipalities with a population of 30,000 and above and which have Health Officers, a more detailed causes of deaths have been ascertained and compiled in Annexure H. The leading causes of deaths were congenital debility, malformation, premature birth, pneumonia, dysentery, convulsions and diarrhoea.

CHAPTER II--CONTROL OF COMMUNICABLE DISEASES.

CHOLERA.

The mortality from cholera recorded during the past 10 years and the death rates are as hereunder :—

Year.	Number of deaths.	Death rate.
1950	26,432	0.9
1951	12,552	0.4
1952	9,081	0.3
1953	22,445	0.7
1954	1,592	0.1
1955	291	0.01
1956	6	*
1957	2,930	0.1
1958	2,312	0.1
1959	206	0.01
1960	20	*

* Less than 0.01.

The incidence of the disease over the last decade has declined rapidly. The figures recorded in the cyclic years also tend to decrease. With the increased provision of protected water supply, improvement in environmental condition and intensive health education, it is likely that the incidence from cholera will continue to be insignificant.

The State was practically free from cholera infection in 1960, there being only 20 deaths as against 206 in 1959. The Health Officers however reported 26 attacks and 17 deaths in 1960 as against 405 attacks with 173 deaths in 1959. Out of the recorded 20 deaths from cholera, six occurred in two municipal towns and 14 in rural areas.

Special staff were employed and preventive and control measures, such as, chlorination of water sources and anti-cholera inoculations were carried out in the affected and adjoining areas and the infection was brought under control. In other areas, although there was no cholera infection, anticipatory anti-cholera inoculations were carried out among those living in slums, labourers residing in villages alongside rivers and channels and other susceptible groups of population in the deltaic and endemic areas. Systematic chlorination of water sources and fly control measures were undertaken. A total of 312,675 anti-cholera inoculations was done.

The Central Expert Committee and the State Expert Committee constituted to evolve measures for the eradication of cholera in the State concluded that there was no need for a pilot project for cholera control, as the State was now free.

Mobile Epidemic Units.—The scheme for establishing two Mobile Epidemic Units under the Second Five-Year Plan was fully implemented by 1959 and was continued during 1960. The two units stationed at Salem and Madurai were detailed to all the areas affected with epidemic diseases.

The units controlled the spread of epidemics by rushing staff and equipment to the infected places with the least delay and transporting cases for hospitalisation, wherever possible.

DYSENTERY AND DIARRHOEA.

The mortality from these diseases has slightly increased from 29,033 in 1959 with a death rate of 0.87 per 1,000 of population to 31,739 in 1960 with a rate of 0.94. The slight increase is noted only in rural areas as will be seen from the distribution of mortality according to different areas shown below :—

Areas.	Number of deaths from Dysentery and Diarrhoea.		Death rate	
	1959.	1960.	1959.	1960.
	(1)	(2)	(3)	(4)
State	29,033	31,739	0.87	0.94
Rural	16,943	19,439	0.69	0.79
Urban	12,090	12,300	1.37	1.37
Municipal Towns..	10,292	10,308	1.71	1.65
Census Towns ..	1,798	1,992	0.64	0.72

The slight increase in the mortality in rural areas is due to the sudden increase in deaths from diarrhoea reported from North Arcot and South Arcot districts in December 1960. These diseases were responsible for 7.8 per cent of the total number of recorded deaths as against 7.3 in 1959.

The registered number of deaths from this groups of diseases in each district in each month in 1960 and the death rates are given in Statement X of the appendix. As usual, the recorded incidence shows two peaks—one in August and another in December—the latter being more pronounced. Compared to 1959, there was an increase in the recorded deaths from these diseases in the districts of North Arcot, South Arcot, Tiruchirappalli, Madurai and Ramanathapuram.

The numbers of death from dysentery and diarrhoea separately are available for all municipal towns. There were 5,938 deaths from dysentery giving a death rate of 0.95 and 4,370 deaths from diarrhoea with a death-rate of 0.70. Of these deaths, Madras City alone was responsible for nearly half of the mortality from dysentery and for 44 per cent of that diarrhoea.

ENTERIC FEVER.

The notification of enteric fever cases is poor and grossly incomplete even in municipal areas. Resort is therefore made to study mortality data from this disease which are available for municipal areas. The number of deaths registered under this cause was 544 giving a death rate of 0.09 in 1960, as against 486 with a rate of 0.09 in 1959. All except 14 municipalities reported deaths from enteric fever. The mortality was high in Madras (137), Madurai (60) and Coimbatore (38). The public health staff carried out the necessary preventive measures—chlorination of water sources and general sanitation of the affected areas. Thirty thousand two hundred and two TAB inoculations of contacts were also performed.

SMALLPOX.

The recorded mortality from smallpox has further decreased in 1960 as will be seen from the following statement :—

Year.	Number of deaths.	Death rate.
1951	7,930	0.3
1952	2,385	0.1
1953	2,588	0.1
1954	1,409	0.1
1955	1,101	0.03
1956	1,129	0.03
1957	3,893	0.12
1958	5,498	0.17
1959	2,225	0.07
1960	1,744	0.05

The deaths from smallpox form only 0.4 per cent of the total registered deaths.

The distribution of smallpox deaths in the different areas in 1960 as compared with 1959 is shown below :—

Areas.	1959.		1960.	
	Number of deaths.	Death rate.	Number of deaths.	Death rate.
	(1)	(2)	(3)	(4)
State	2,225	0.07	1,744	0.05
Rural areas ..	1,337	0.05	894	0.04
Urban areas ..	888	0.10	850	0.09
Municipal Towns ..	821	0.14	754	0.12
Census Towns ..	67	0.02	96	0.03

There was reduction in the mortality in all except census town areas as compared with 1959, the fall being large in rural areas.

As per the reports of the Health Officers, there were 5,332 attacks and 1,320 deaths only in 1960 as against 6,699 attacks and 1,726 deaths in 1959. The difference in the mortality from smallpox as reported by the Health Officers and as recorded by the registrar of births and deaths is partly due to wrong classification of the cause of deaths.

The number of deaths from smallpox registered in each district in each month, the annual death rates and the distribution of these deaths as per age groups are given in Statement VIII of the Appendix. Madras City continued to record the largest number of deaths (521) and was responsible for 30 per cent of the total deaths from smallpox in the State. The districts of Chingleput, North Arcot, South Arcot, Thanjavur and Madurai reported sporadic cases throughout the year, while stray cases were recorded in all the other districts except the Nilgiris and Kanyakumari which were practically free. Compared with 1959, the incidence was less in all the districts except Madurai and Tirunelveli districts.

The municipalities that registered high mortality from smallpox were Bodinayakanur (21), Chingleput (15) and Chidambaram (13) during the first half of the year.

There was an increase in the recorded deaths from smallpox from January reaching a maximum in March and April. After a fall in May and June, the mortality again reached a second peak in July and August. Thereafter the incidence steadily declined.

The distribution of deaths from smallpox according to age groups was as hereunder :—

Age Groups.	Number of Deaths.	Percentage to Total Deaths.
Under one year	466	26.7
One year and less than 10 years	736	42.2
10 years and above	542	31.1
Total ..	1,744	100.0

More than two-thirds of deaths from smallpox occurred in the age group under 10 years. Evidently several infants still escape primary vaccination.

Control measures.—Besides mass vaccination and revaccination campaigns launched in the affected and surrounding areas, disinfection of infected premises and materials and home segregation of cases and isolation of cases in hospital wherever possible and education of the people on the mode and spread of smallpox were also undertaken. Intensive house to house inspection was conducted to detect hidden cases of smallpox for segregation and unprotected children for vaccination. Additional Health Inspectors from the epidemic reserve were also posted to heavily affected areas. To facilitate prompt movement of staff and equipment, the services of the Mobile Epidemic Units and jeeps were fully utilised in the affected areas.

VACCINATION.

In view of the large pendency of unprotected cases noticed in a number of places and the increase in death from smallpox in March, the usual " off-season " was cancelled to enable the vaccinators to carry out intensive vaccination campaign in the affected and surrounding areas.

The scheme for systematic re-vaccination of one-tenth of the population in each district in a year was continued, so that the entire population in a district might be covered in 10 years. This programme has also helped in the easy verification of vaccinated cases.

In view of the continued prevalence of smallpox incidence in the city of Madras, the Government felt that the measures undertaken by the Corporation of Madras were not fully effective and sufficient to cope with the smallpox situation in the city. Hence under section 6 of the Madras Public Health Act, 1939, the Government empowered the Director of Public Health to inspect, control and superintend the operations of the Madras Corporation in the field of smallpox control. The Director of Public Health drew up a scheme for control of smallpox in the city of Madras for adoption by the Corporation of Madras. The scheme envisages the complete control and eventual eradication of smallpox from Madras City by planned, systematic and intensive vaccination of the entire population of the Madras City within a period of 4 months.

In several districts adequate vaccination staff have not been appointed due to dearth of qualified hands. Temporary trained hands were therefore appointed during epidemics. Moreover, one Health Assistant is not able to vaccinate satisfactorily a population of 50,000 in a vast area.

In Statement XIII of the Appendix particulars regarding number of persons who had primary and revaccination in each district and municipal town are given. The numbers of persons vaccinated in different areas/agencies in 1960 as compared with 1959 are extracted below :—

Area/Agency.	Primary vaccination.		Re-vaccination.		Total.	
	1959.	1960.	1959.	1960.	1959.	1960.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Districts inclusive of Municipal Towns.	911,556	1,08,802	3,733,186	3,531,282	4,644,742	4,440,084
Health Unit, Poonamallee.	3,384	2,640	13,818	8,423	17,202	11,063
Municipal Towns ..	211,807	226,208	1,270,371	1,589,319	1,482,178	1,815,527
Railways ..	2,239	2,114	14,781	55,120	17,020	58,960
Medical Institutions and Ports.	7,675	3,840	77,710	20,143	85,385	22,257
Total ..	1,136,661	1,142,604	5,109,866	5,204,287	6,246,527	6,347,891

An examination of the above statement shows that the number of persons primarily vaccinated was a little more in 1960 than in 1959. This excess was due to the greater number of persons primarily vaccinated in municipal areas only. The number of persons re-vaccinated in 1960 was also in excess of that in 1959, due again to the large number of revaccinations performed in municipal areas and by the Railways.

The primary and re-vaccination operations performed in each district and municipality, railway areas, ports and medical institutions, successful and unsuccessful operations, the successful primary operations distributed according to age are also furnished in Statement XIII of the Appendix. The difference in the number of primary and re-vaccination operations and the corresponding number of persons vaccinated in the different areas represent the number of secondary vaccinations. Out of 1,162,915 primary vaccination operations 19,311 were secondary and out of 5,205,078 re-vaccination operations, 791 were secondary.

The percentages of successful vaccination operations performed by different agencies among the cases for which results were known, are given below :—

Agency.	Percentage of success among.			
	Primary		Re-vaccination	
	1959.	1960.	1959.	1960.
(1)	(2)	(3)	(4)	(5)
Districts exclusive of Municipal Towns.	88.0	92.6	14.9	12.7
Health Unit, Poonamallee ..	93.1	96.2	13.7	16.3
Municipal Towns	97.0	98.0	11.7	9.2
Railways	98.2	98.5	11.7	18.9
Medical Institutions and Ports.	93.0	95.0	63.2	59.4
State ..	90.1	93.9	14.0	12.1

The success rates for primary vaccinations performed by all agencies are high and those for re-vaccinations done by all agencies except medical institutions and ports were low.

The number of successful primary vaccinations performed as per age groups in 1960 was as follows:—

Age groups.	Number of successful primary vaccinations.
(1)	(2)
Under 1 year	482,263
1 year and under 5 years	336,572
5 years and under 10 years	45,375
10 years and above	2,158
Total	866,368

The above statement shows that a good number of children above one year were not protected. It is very necessary that all infants should be protected as early as possible, so that they may not serve as a source for dissemination of smallpox.

With a view to eradicating smallpox, proposals have been formulated under the Third Five-Year Plan to protect the entire population of the State by vaccination within a period of three years, the first two years being taken up for preliminary arrangements and the third year for the actual vaccination. As a preliminary to this scheme, the Central Expert Committee recommended pilot project in Chingleput district with cent per cent assistance from Government of India. The work of the project undertaken during the year is detailed below.

SMALLPOX ERADICATION.

Pilot Project Scheme, Chingleput district.—A National Smallpox Eradication Programme for India was worked out by the Central Expert Committee jointly with the representatives of the State Expert Committees on smallpox and cholera. In order to assess the requirements of the statewide eradication programme in respect of manpower, finance, equipments, materials, etc., the Committee suggested the establishment of a Pilot Project in a district in each State. Accordingly, Chingleput district with a population of about 20 lakhs was selected. The Government sanctioned the establishment of the Pilot Project with the staff of one Assistant Director of Public Health with necessary clerical staff at the State headquarters and one Health Officer, 140 Vaccinators for seven months, 28 Selection Grade Health Inspectors for six months and two Drivers at the district level.

Preliminary preparations.—During the first five months (April to August 1960) preliminary arrangements were made. Refrigerators, Vaccination kits, Ice Boxes, Jeeps, Cycles and other equipments and materials were obtained. Various weekly and monthly return forms, two coloured posters, three leaflets and pamphlets and one illustrated folder on smallpox and vaccination were printed. A Comprehensive Manual on Smallpox and Vaccination was also prepared and printed copies distributed to all the health and vaccination staff for their study and reference. Fresh registers showing the members in each family were prepared for the whole district with the help of the local health staff, the Community Development Block staff, 25 paid enumerators and 140 vaccinators employed for vaccination work.

Personnel.—Nearly 200 S.S.L.C. completed candidates were given training in vaccination on a purely voluntary basis for a period of six weeks under the permanent Health Inspectors in nine centres. Theoretical and practical field training was given to the staff under the direction and supervision of the Assistant Director of Public Health and the Special Health Officer. Out of 200 trainees 140 were selected on the basis of their merit and results of field work for appointment as vaccinators. Twenty-eight Selection Grade Health Inspectors were posted to supervise the vaccination work of the 140 vaccinators. The above staff were divided into 28 units, each unit consisting of one Health Inspector and five vaccinators. The Health Inspector was responsible for the vaccination work entrusted to his unit.

Health Education.—A detailed programme for educating people on smallpox and vaccination was undertaken during the preliminary stage. The local health staff arranged meetings in various towns, panchayats and villages by contacting local leaders and explained to them the programme in detail. Prominent people of the locality were requested to speak on the occasion about smallpox and its eradication by planned mass vaccination. Later in the evening films on smallpox were shown. Leaflets, pamphlets and folders on smallpox and vaccination were distributed to the public at the end of the film show. A health education van fitted with cinema projector, public address equipment, etc., was sent to all the important villages to exhibit films and to give short talks on the subject. Slides on smallpox and vaccination which were specially prepared were distributed to the cinema theatres for exhibition. Health Education on smallpox eradication and vaccination were conducted for all the staff of the 18 Community Development Blocks in the district.)

The Collector of the district, the Inspector of Municipal Councils and Local Boards and other District Officers were requested to issue detailed instructions to the Revenue Officials, Village Headmen, Block Development Officers, Municipal Commissioners, Executive Officers of panchayats, etc., to co-operate with the vaccination staff to make the scheme a success.

Mass vaccination.—(The mass vaccination programme was inaugurated on 1st September 1960.) It was programmed to vaccinate the whole population of the district within six months. For this purpose, the district was divided into eight zones, each zone representing a taluk with about 2 to 2½ lakhs population. Each zone was further divided into two sub-zones and each sub-zone into four sub-centres. Each sub-zone was taken up for intensive mass vaccination in turn.

Twice a week fresh vaccine was supplied from the King Institute, Guindy, to each sub-centre. All the necessary stores such as cotton, spirit, zinc powder, forms, stationery, leaflets, folders, pamphlets, posters, etc., were stored in the sub-centres. Each sub-centre was placed under one vaccinator.

Each unit was given a certain number of villages with a total population of about 5,000 to 6,000. Each unit took about 10 to 14 days to complete vaccination in the villages allotted to them in each sub-zone. Each Health Inspector and Vaccinator except ladies was provided with a cycle. Each Health Inspector was supplied with one Ice Box and each Vaccinator with one vaccination kit containing all the equipment. Each afternoon the Health Inspector arranged through one of his vaccinators to get fresh vaccine for the next day's work from the refrigerator kept in the nearest sub-centre. Vaccination depots are set up in every street at convenient places.

The vaccinators visited each and every house to carry out vaccination. Printed chit containing particulars about the name of the head of the family and the number of members in the family, the address, the page number of the family register in which the particulars are registered, etc., was issued to the head of each household. The members of the family were vaccinated and the date of vaccination was entered in the Register against their names in the appropriate column. The hours of work were from 6-30 a.m. to 10-30 a.m. and 3 to 6 p.m. Night work was also arranged wherever required for the benefit of labourers who returned from the fields late in night.

Inspection.—Both the special Health Officer and the Assistant Director of Public Health toured the area intensively, guiding and supervising the work of the staff. The Director of Public Health also periodically inspected the field work of the staff and reviewed the work and issued necessary instructions to improve the tempo of work. During the visits, the work of Vaccinators and Health Inspectors were inspected by the officers regarding technique, honesty and correctness of work. A certain number of houses at random were checked with family registers to see whether all the members of the family were vaccinated and whether the vaccinations shown to have been done in the registers had been actually carried out.

Work done so far.—Out of the eight taluks in the district with a population of 20 lakhs, five taluks were covered up to 21st January 1961. The actual number of vaccinations performed and success rate and other particulars are as given hereunder:—

Abstract of the work done (1st September 1960 to 21st January 1961).

Population of the Pilot Project District	20 lakhs.
Population covered so far in five taluks	11.56 lakhs.
Vaccinations done—	
Primary Vaccination	41,650
Revaccination	7,41,548
Percentage of population covered by vaccination	67.8
Number of Vaccinations inspected—	
Primary Vaccination	17,765
Revaccination	257,009
Percentage of Primary Vaccination inspected	42.6
Percentage of Revaccinations inspected	34.7
Percentage of success —	
Primary Vaccination	97.8
Revaccination	40
Number of vaccinations per vaccinator per working day	75

In addition to the vaccinations performed by the pilot staff, 185,710 vaccinations have also been done by the permanent health staff in these areas during the period. If these figures are taken into account, the population protected by vaccination will come to 84 per cent.

The permanent health staff have been instructed to mop up all the cases left unvaccinated by the Pilot Project staff. The high percentage of success is due to the use of fresh and potent vaccine issued daily from the refrigerators and good vaccination technique and proper supervision.

The Pilot Project work is progressing and will be completed by the end of March 1961.

PLAGUE.

During the year under report seven villages in Hosur taluk in Salem district were affected with plague and there were 29 attacks and 14 deaths. The date of the first onset of the infection was 27th February 1960 and two villages were affected. The source of infection was traced to infested ragi transported from Dadinaickendoddi village in Kolar district, Mysore State, bordering the infected area in Madras State. The infection was controlled in March. Again, five cases with two deaths from plague were reported in July. After a period of quiescence, four other villages were affected recording 16 cases and eight deaths between October and December. All the infected and the neighbouring villages were immediately treated with D.D.T. and 55,002 anti-plague inoculations were carried out. The anti-plague measures were supervised by officers from headquarters. All the other districts were completely free from plague.

All the 1,646 villages in Salem, Nilgiris and Coimbatore districts and the towns of Coimbatore, Coonoor and Ootacamund endemic for plague were treated with D.D.T. regularly. During the year under report 170,494 houses, 93,435 hutments, 1,366,276 rodent burrows and 342,599 cracks and harbourages were treated with 115,016 lbs. of 10 per cent D.D.T. and 7,297 lbs. of 50 per cent D.D.T. Block fumigation of 702 grain shops and godowns with cyanogas "A" dust was also carried out. Regular rat-trapping was done in all the endemic areas systematically and periodically for rat-flea survey and as an anti-rat measure and for detection of any evidence of smouldering plague infection in the rat population. The number of rodents destroyed by fumigation and trapping was 47,332. On these 8,788 were examined but no rat was infected. Rat flea surveys in all the D.D.T. treated areas have shown that the rat flea indices are generally below one except in a few places. Special attention was bestowed to these areas with more intensive treatment with D.D.T. to reduce the flea indices below one.

FEVERS OTHER THAN MALARIA.

The number of deaths registered under this group of 'fevers other than malaria' was 59,982 in 1960, showing a very slight increase of 2,410 deaths over that in 1959; the death rate was 1.78 in 1960 as compared to 1.73 in 1959. The downward trend in the fever mortality rates noticed in the past decade is however maintained. The distribution of these deaths as per different regions is shown below.

Deaths from fevers other than Malaria.				
Areas.	1959.		1960.	
	Number.	Death Rate.	Number.	Death Rate.
(1)	(2)	(3)	(4)	(5)
State	57,572	1.73	59,982	1.78
Rural	47,487	1.95	49,402	2.00
Urban	10,085	1.15	10,580	1.18
Municipal Towns	5,792	1.0	6,189	0.99
Census Towns	4,293	1.5	4,391	1.59

Compared to 1959, there has been an insignificant increase in the mortality recorded in all the areas.

This group of diseases was responsible for 14.7 per cent of the total registered deaths in 1960, practically the same as in 1959. In municipal areas, the mortality from this group forms only 6.6 per cent of deaths from all causes, while in non-municipal areas it is 16.3 per cent. In rural areas the fever mortality is the largest among the known causes of deaths. It must however be stated that the classification of causes of deaths in rural areas is not quite accurate.

The mortality from fevers other than malaria recorded in each district in each month, the annual death rates for each district and the State are given in Statement IX of the appendix. The death rates ranged from 0.84 in Thanjavur district to 2.95 in North Arcot district. Compared with the average fever death rate during 1955-59, the recorded death rates in all the districts are less except in Kanyakumari district. The mortality gradually decreased in the first three quarters of the year and increased in the last quarter, the increase being abnormal.

The municipalities that recorded high fever death rates were Tiruvotthiyur (3.3), Padmanabapuram (3.1), Shencottah (2.9), Dindigul (2.8), Arni (2.8) and Walajapet (2.7).

MALARIA.

The mortality from malaria has further decreased from 732 in 1959 to 637 in 1960. The percentage of deaths from malaria to total deaths was only 0.14. Compared with 1959, there has been a decrease in all the regions except in census towns as will be evident from the following statement:—

Area.	Deaths from Malaria.			
	1959.		1960.	
	Number.	Death Rate.	Number.	Death Rate.
State .. .	732	0.02	637	0.02
Rural	574	0.02	505	0.02
Urban	158	0.02	132	0.01
Municipal Towns	95	0.02	67	0.01
Census Towns ..	63	0.02	65	0.02

The monthly and annual mortality recorded in each district and in each month and the death rates are given in Statement IXA of the appendix.

MALARIA CONTROL.

The Bureau of Malariology at the State level under the immediate control of the State Malaria Officer and the two Regional Malaria Organisations at Coimbatore and Thanjavur were continued on a permanent basis. The malaria eradication programme was carried out by 31 units organised in the whole State under the direction of the State Malaria Officer assisted by special staff. The distribution of the units is shown in Chart No. 7. The Regional Malariologists were responsible for anti-filariasis and anti-mosquito measures in the local areas.

Activities of the Central Malaria Laboratory and Museum at Madras.—Laboratory experiments and field tests on larvicidal oils and tests on susceptibility status and survival rates of mosquitoes were carried out in the Central Malaria Laboratory. Colonies of *A. stephensi*, *Culex fatigans* and *Aedes* mosquitoes were maintained, as also the strain of *P. Praecox* for purposes of

demonstration and training. Demonstrations and lectures on Entomology, Parasitology, Haematology, Epidemiology and Control and Eradication of Malaria were arranged for the benefit of students from the Medical Colleges of Madras, the Veterinary College, Madras, Public Health Engineers, Public Health Nurses, Health Visitors and Grama Sevaks. Courses in Malaria Training were conducted for 28 Surveillance Inspectors, 200 Surveillance Workers and 24 Field Assistants. Special lectures and demonstrations were arranged for the surveillance personnel. The Bureau participated in the exhibitions organised on World Health Organisation Day at the Madras Medical College, Corporation Health Section and Madras Christian College, which were appreciated by the public. In connection with the World Health Day Celebrations lectures on Malaria Eradication were arranged for the students in the various institutions in the city.

Regional Malaria Organisation, Coimbatore.—The jurisdiction of this organisation extended over the districts of the Nilgiris, Coimbatore, Salem, North Arcot and Chingleput. Fifty check-up surveys were carried out in connection with anti-filariasis and anti-mosquito schemes. Special surveys were undertaken in two panchayats to formulate schemes for anti-mosquito measures. Re-surveys were undertaken in two panchayats to find out the immediate needs of the areas which are expanding. The organisation participated actively in exhibitions arranged by local bodies or institutions.

Regional Malaria Organisation, Thanjavur.—The jurisdiction of this organisation extended over the districts of South Arcot, Thanjavur, Tiruchirappalli, Madurai, Ramanathapuram, Tirunelveli and Kanyakumari. Half-yearly check-up surveys were conducted in connection with 73 schemes for anti-filariasis and anti-mosquito measures implemented by the local bodies. New schemes for anti-mosquito measures were instituted in two panchayat boards and two municipalities. Thirteen preliminary surveys to formulate schemes for anti-filariasis measures or anti-mosquito measures were undertaken. The experimental anti-filariasis schemes functioning in Malaipatti panchayat of Ramanathapuram district and financed by State Government continued to show good progress and no evidence of transmission of disease was noticeable in that area. The organisation took part in the fly control operations at Velanganni where a number of people attended the annual festival and in exhibitions arranged by local bodies or medical institutions, festival centres, etc., wherein the importance of control of insect-borne diseases was impressed on the people.

Survival and susceptibility tests on mosquitoes were carried out in the laboratory. Fourteen Sanitary Inspectors and 48 Field Assistants underwent one month's training course in malaria and mosquito-borne diseases. Training for 153 surveillance personnel was undertaken.

Parasite control and malaria surveillance.—In the present context of malaria surveillance in which every case of fever is treated with four-aminoquinolines and every malaria case diagnosed is treated with eight-aminoquinolines, the question of free quinine distribution does not arise.

NATIONAL MALARIA ERADICATION PROGRAMME.

The State Malaria Officer was in direct charge of the National Malaria Eradication Programme. Three Special Supervisory Unit Officers continued to be in charge of three zones into which the State has been divided. These

three Officers were assisted by eight Supervisory Unit Officers in all, each of them being in charge of about three or four units. In view of the increased work-load on the implementation of the surveillance phase, the employment of seven additional Supervisory Unit Officers has been sanctioned. Due to dearth of Medical Officers these posts were not filled up. The unit is in charge of a Unit Officer. The unit is split up into four sub-units, each in charge of two sub-unit officers. In case of Saidapet Unit, owing to additional transferred territory from Andhra State, an additional circle was added to one of the sub-units. Necessary laboratory and field staff and administrative and executive personnel continued to function.

The National Malaria Eradication Programme included under the second five-year plan from 1958-59 functioned successfully during the third year of the attack phase. The programme was implemented as scheduled, so that the reported development of resistance of the vector anopheles against DDT and other insecticides in use might not render it ineffective. A population of 3.7 millions living in 3.7 endemic unit areas coming under the influence of *A. fluviatilis*, *A. culicifacies* and *A. Stephensi* has been brought under coverage for the third consecutive year by two rounds of DDT residual spraying. The rest of the population of the State living in 27.75 hypo-endemic unit areas have been brought under coverage with a single round of DDT spraying during the malaria transmission season for the second consecutive year. The programme of spraying in the rural areas of the entire State, whether endemic or hypo-endemic, has been followed as per calendar of spray activities prescribed for each unit area. In the case of urban and semi-urban malarial areas including the city of Madras, greater emphasis was laid on anti-larval measures since the vector *A. stephensi* breed and rest mostly in wells especially in well walls. The anti-larval measures consisting of systematic weekly treatment of wells with mineral oil emulsion as larvicide and introduction of larvivorous fish (*Gambusia*) in wells which cannot be treated otherwise with oils, etc. were undertaken.

In project areas, both irrigation and hydel, anti-adult as well as anti-larval measures were undertaken. Considering the large aggregation of labour and the inevitable man-made breeding places incidental to engineering projects, a second round of spray was also carried out in these areas covered by 1.5 units though situated in hypo-endemic areas. Further, a systematic co-ordination of the activities of the health and engineering personnel in all projects, either completed or in progress or under contemplation, was ensured. Likewise the anti-malarial operations in Estate areas in hills were co-ordinated with those of the State organisation through a Liaison Officer of the Central Government. The anti-malarial operations in military establishments and cantonment areas were similarly co-ordinated with those of the State organisation and facilities for exchange of reports, findings etc., have been provided for. A working arrangement for anti-malarial operations in the railway colonies and the adjacent state areas, was arrived at and implemented successfully.

The endemic malarious areas in the State are divided into three categories. There are endemic areas coming under the influence of (i) *A. fluviatilis* in hill and foot hill regions, (ii) *A. culicifacies* in the plains and (iii) *A. stephensi* in certain urban and semi-urban areas. The rest of the State is treated epidemiologically as hypo-endemic areas.

In accordance with the logistics worked out for the hyper-meso endemic and hypo-endemic areas of the State, the following calendar of activities has been scheduled for carrying out DDT residual spraying operations :—

		A. fluviatilis endemic.	A. culicifacies endemic.	Hypo- endemic.
A. In all the districts except the Nilgiris.	First round	15th May to 31st July.	1st July to 15th Sep- tember.	15th July to 15th Sep- tember.
	Second round	1st Septem- ber to 15th November.	1st October to 15th December.	Nil
B. In the Nilgiris.	First round	1st Febru- ary to 1st May.	..	..
	Second round	1st October to 1st January.	..	..

In the present context of Malaria eradication when active surveillance is in operation covering the entire population of the State, the malariometric data of spleen, parasite and morbidity rates have no significance. However, these data for 1960 as compared with 1959 and the activities of each of the National Malaria Eradication Programme Units are given in Annexure T 1.

SURVEILLANCE PHASE OF THE PROGRAMME.

The Madras State was the first to implement the surveillance phase nearly according to the scheduled programme. During the year, the crucial malaria surveillance phase was launched concurrently with the third continuous year of intensified DDT spraying operation under the attack phase. The surveillance phase is essentially an anti-parasitic operation, actively seeking out positive cases of malaria and radically treating them, so that the human reservoir of infection is burnt out to such a low level that the vector mosquitoes will not be capable of transmitting fresh infection.

The mode of operation is set in two stages. Firstly, it consists of house to house visits once in a fortnight by the surveillance workers, detection of all current and past fever cases by careful enquiries and taking of blood smears from all such cases and treatment of the cases on the spot with four-aminoquinolines. The second stage consists of taking of blood smears, their examination at the unit laboratories and treatment of those cases positive for malaria with eight-aminoquinolines.

Surveillance Organisation.—The organisational set up for surveillance work was as follows :—

The unit for attack phase was divided into four sub-units, each sub-unit being again divided into two circles. Each circle is under the full charge of a Malaria Inspector. This has been adopted as against the pattern of Senior and Junior Malaria Inspectors proposed for each sub-unit. Every circle is further divided into three surveillance sub-circles. One Surveillance Inspector and four Surveillance Workers were posted for each sub-circle. Twenty-five Surveillance Inspectors and 100 Surveillance workers in 25 sub-circles will constitute a surveillance team which has been formulated for functional as well as administrative convenience. The population under each of the 31.45 units in the State varies from 0.7 million to 1.3 millions depending upon the nature of the malaria problem and the terrain to cover. Owing to the same reasons, the number of sub-circles in each of the units also varies from 18 to 34. To attract suitable persons and hold them over

working continuously in difficult areas, four different gradations of pay scales were adopted for the Surveillance Inspector and Surveillance Workers employed in the State. These details of planning of organisation of the surveillance programme as well as the procurement of the minimum amount of microslides, stains and other materials and equipment were completed in February 1960.

A huge programme of recruiting and training of surveillance workers was also carried out concurrently. A syllabus for a seven-day course of training was drawn up and communicated to all the officers in the Bureau for training Surveillance Workers. Candidates who had either passed or failed matriculation were recruited on talukwise basis from all the districts, so that they could be located within their home jurisdictions. Each training centre held four to five courses of training and 6,124 Surveillance Workers were trained by March 1960 as against the total State requirement of 3,100. No allowance or stipend was paid to the trainees during training period. From among the trainees a merit panel was drawn up according to their performance in theory, practical and oral and other capabilities through a system of cross-testing so that the top third could be selected for appointment later as Surveillance Inspector after they gained experience as Surveillance Workers.

The Surveillance Workers were ready to go into position on the 1st of April 1960, the scheduled date for the implementation of the surveillance programme in the country. However, sanction for the implementation of the surveillance programme was received only in the last week of April and Surveillance Workers in all the units were appointed by end of April 1960.

At the outset, there was some difficulty in introducing the Surveillance Workers into the field. Therefore, an attested identity card was devised so as to enable them to present the same to any inquisitive questioner anywhere. Further, for the general identification of the personnel, identity discs or badges as well as uniforms for both men and women workers were prescribed. The first two to four weeks of the inception of surveillance programme were utilised for introducing the Surveillance Workers into the villages through all the available official agencies for taking a house to house census in the entire State as well as to orient each worker to understand what he is actually in. Besides this, sanction for the employment of Surveillance Inspectors was not received in time. It was, therefore, not possible to supervise the work effectively in the early stages. Sanction for appointment of Surveillance Inspectors was received in the first week of September 1960. As stated already the best third among the Surveillance Workers were selected and given a further training through a 10-day course and were ready to go into position with substitutes ready to take their places also. About the second and third week of September, the appointment of the Surveillance Inspectors was completed. With the appointment of the Surveillance Inspectors, a spurt of intensive surveillance work was definitely noticeable.

Surveillance work.—The percentage of fever cases recorded during each month from May to October in each unit varied from 0.1 to 1.0. The rates are low due to the following: (i) microslides and drugs, especially four-aminoquinolines, were not received in time, (ii) there was frequent change in surveillance personnel as they resigned from duty owing to the arduous nature of the work and insecurity of job and the possibility of their obtaining easier jobs on higher emoluments elsewhere, (iii) the Surveillance Inspectors were not employed until September, and (iv) finally, the lack of whole-hearted co-operation from certain sections of the public especially in urban areas.

The number of fever cases detected and treated in 1960 by the Surveillance Workers in each unit is given in annexure T-2.

In the matter of despatching the blood slides taken, their receipt in the unit office, examination by the microscopist and reporting back the results, delays were noticed to occur. Provision to meet the cost of transporting the blood slides from the field to the sub-units was not contemplated originally. The allotment under contingencies, was, therefore, not adequate. To reduce the cost wherever possible, cheap methods of sending samples were improvised; for instance, card board cartons were prepared out of empty DDT cartons for the despatch of slides to the unit headquarters. Collection by special messengers provided with cycles or other vehicles, was also tried, but there were delays. Moreover, the 2 microscopists allotted to each unit were unable to cope with the examination of slides and communicate the results promptly. The negative results were despatched in batches, but positive results were communicated then and there either by telegram or special messenger.

The radical treatment of positive cases of malaria could not be instituted earlier than October as eight-aminoquinolines were received only during September/October 1960 (two lakhs in September and 13.7 lakhs in October 1960). Excepting five cases, all other positive cases (181) were given the full course for five days in divided doses. In the initial stages the Supervisory Unit Officers and the Unit Officers themselves instituted the radical treatment so as to acquaint themselves first hand with any adverse reaction of administration of eight aminoquinolines. Later the Sub-Unit Officers and the Surveillance Inspectors administered the drug.

SUPERVISION OF SURVEILLANCE WORK.

The Surveillance Inspectors inspected twice in a fortnight the work of all the four Surveillance workers and in some cases thrice and in urban areas even four to six times. The usual pattern of supervision for a Surveillance Inspector was to check up the work of a Surveillance worker on the spot and also to visit at random villages visited by the Surveillance worker previously. Frequent surprise inspections by the Surveillance Inspectors out of the routine have also been carried out. On the experience gained, the following pattern of supervision for the Surveillance Inspectors was adopted. Since one Surveillance Inspector has to supervise four Surveillance Workers in a 13-day work schedule, he was asked to supervise the work of one Surveillance worker every day and complete one round of supervision of the work of all the four workers in four days, recommence the second round of inspection on the fifth working day and complete it on the eighth day and carry on a third round of supervision from the ninth to twelfth day with the thirteenth day left for surprise inspection. Thus, one Surveillance Inspector should complete three rounds of inspection of the work of all the four Surveillance workers in a fortnight. When radical treatment of a number of cases is undertaken, it may not be possible to carry on such intensive supervision.

The work of the Surveillance Inspector was to inspect the work of the Surveillance Worker on the spot and cross check by independent enquiries in at least 40 houses in the village visited and in addition, to check up the work in at least three other villages wherein the Surveillance Worker had worked during the previous three days and cross check in at least 20 houses in each of these villages. By this arrangement, the Surveillance Inspector

would on any day have covered at least four villages and cross checked in at least 100 houses. Since the time taken by the Surveillance Inspector for a house visit is generally less than that of a Surveillance Worker, at the nature of his enquiry is different from that of a Surveillance Worker, it is possible for him to visit all 100 houses in four villages in a day.

In order to facilitate the checking of the work of Surveillance Workers, it was proposed to have a house-card for each house visited, showing the particulars of inmates in the house and other particulars recording the work done by them. But, as the cost was prohibitive it was given up. However, the wall-space was utilised to mark out the details of work and Surveillance personnel noted the dates of their visits and initials in the appropriate columns. Positive cases were entered in red colour on these charts. Wherever no proper wall-space was available, card-board was nailed on a convenient spot on which the particulars of visits were entered. But there is the risk of the entries in pencil on charts being erased by children and others or through white-washing. The house-owners were requested not to erase the entries on the charts.

To guide the Surveillance workers properly, continuously and progressively, they were required to carry a pocket note book as a sort of 'diary of instructions', in which the inspection notes of the supervisory personnel might be noted on the spot. To increase the efficiency of supervision of the Surveillance Inspectors, daily diary, report on fever cases missed by the Surveillance Workers, special report or surprise inspection report on the follow up of radically treated cases etc., have been prescribed.

The Malaria Inspectors supervised the work of Surveillance Inspectors and Surveillance Workers during their visits to villages for spraying, mopping, post-operational survey, etc. They generally made surprise inspections, as they were specially utilised in the epidemiological investigation of positive malaria cases including contact or mass blood surveys.

At the level of the Unit Officers and Zonal Officers, intensive supervision especially at the peripheral level was positively necessary. The Unit Officers were required to supervise the outturn of work of each Surveillance Worker in such a manner as to cover the work areas of all the Surveillance Workers in his unit within four to six weeks. During their inspection tours they should personally contact every Surveillance Inspector at least once in four to six weeks and every Surveillance Worker atleast once in eight to twelve weeks. He should convene a one-day conference with the Surveillance Inspectors once in two months to discuss special problems in which the Zonal Officers would also participate.

PASSIVE SURVEILLANCE.

Under passive surveillance, the medical institutions and private practitioners were requested to report malaria cases treated by them to the concerned units. In spite of repeated circulars, special requests, personal contacts, etc., the co-operation of the Medical Institutions and practitioners was not generally secured. The voluntary and official agencies helped the Department to some extent. However, advantage was taken of the co-operation wherever available.

In the plantation and estate areas, railway and military areas, airports and harbours, the surveillance work was undertaken by this Department, although the programme of spraying was conducted by the concerned authorities in co-operation with this Department.

All minor projects were covered for surveillance under the respective units. Parambikulam which is a special project area in the State, likely to develop into a huge establishment in due course, is to be covered through the implementation of an additional sub-unit with additional surveillance personnel. In this special project a weekly surveillance is contemplated. Since this project covers the States of Madras and Kerala, a concurrent arrangement on the Kerala side may also have to be considered.

FILARIA CONTROL.

Filariasis has been endemic in several districts and found to be more widespread in the districts of Chingleput, South Arcot, North Arcot and Thanjavur. The problem of filariasis is not mainly confined to urban areas as commonly believed, but is also prevalent in urbanised rural areas in varying degrees. The species of the parasitic worm causing the disease is *Wuchereria Bancrofti* and the vector mosquito transmitting this type of infestation is *Culex fatigans*. "Malayi" type of filariasis has not been recorded in this State, though the species of mosquitoes transmitting this type of filariasis, viz., *Mansonioides* in association with *Pistia* has been recorded in entomological collections.

State Schemes.—Anti-mosquito and anti-filarial schemes have been in operation in several local areas subsidised by the Government with grants-in-aid to the local bodies that implement and carry out approved schemes satisfactorily. The local bodies carried out organized anti-larval measures which consisted of treatment of breeding places of *Culex fatigans*, mainly with effective mineral oils and occasionally with synthetic larvicides. Necessary technical advice and guidance regarding planning, organisation, programme and technique were given by the two Regional Malariologists after frequent inspections, reviews and assessments. The Regional Organisations also conducted detailed half-yearly surveys and reported on their progress. Necessary recommendations based on evaluations to improve the operations of such schemes were made to the local bodies concerned.

National Filaria Control Programme.—The four National Filaria Control Units established during 1957-58 under the National Filaria Control Programme, sponsored by the Central Government with grant-in-aid to the State Government, continued to function in the districts of Thanjavur, South Arcot, Chingleput and North Arcot. Each Unit was expected to cover a population of three lakhs, for purposes of control operations. The sheet anchor of control operations consisted of anti-larval measures against the aquatic stages of *C. fatigans* mosquito breeding in dirty water collections. Spraying of mosquito control oil was intensified and extended to more rural and urban areas. Minor engineering measures, like filling up of pits, canalisation of drains and pools, construction of soak pits, cleaning of masonry drains, removal of slum from disused wells, filling up of unused wells and removal of rank vegetation, etc., aimed at eliminating the breeding places of mosquitoes as far as possible were also carried out. Post control and routine entomological surveys in the special study areas and the check areas for purposes of observing and assessing the effects of control measures undertaken for part of the year was discontinued as per instruction of the Malaria Institute of India. A special entomological survey was conducted in Basin Bridge area to find out whether F. Malayi infection has been occurring through boatmen coming from endemic areas of Sriharikota in Andhra Pradesh.

Sustained health education activities were undertaken to enlist active co-operation of the public in the anti-filaria schemes. Mass Hetrazan Therapy Campaign was continued and completed in North Arcot and South Arcot Districts by the units at Vellore and Chidambaram.

Five Health Inspectors were deputed to the Malaria Institute of India for training in filaria for four weeks.

RESPIRATORY DISEASES.

Respiratory diseases were responsible for 9.9 per cent of the total registered deaths as against 10.4 per cent in 1959. The mortality rates from these diseases given hereunder indicate a declining trend during the past five years.

Year.	Death rate from Respiratory Diseases.							
	(1)							
	(2)							
1956	..	..	..	..	..	..	..	1.38
1957	..	..	..	..	..	..	..	1.45
1958	..	..	..	..	..	..	..	1.29
1959	..	..	..	..	..	..	..	1.23
1960	..	..	..	..	..	..	..	1.20

The number of deaths and death rates recorded in 1959 and 1960 in the different regions are tabulated below :—

Areas.	Deaths from Respiratory Diseases.			
	1959.		1960.	
	Number.	Death Rate.	Number.	Death Rate.
State	40,856	1.23	40,612	1.20
Rural areas	20,910	0.86	21,540	0.87
Urban areas	19,946	2.23	19,072	2.12
Municipal Towns	17,894	2.98	17,112	2.75
Census Towns	2,052	0.74	1,960	0.71

A scrutiny of the above figures shows that the mortality rate is high in municipal areas as compared with rural areas. This has been the experience in the past also. The high rates in municipal areas is perhaps due to the congestion incidental to life in towns.

Statement XI of the appendix gives the number of deaths recorded in each district in each month and the death rates. The death rate ranged from 0.52 in Thanjavur and 0.73 in Tiruchirappalli district to 1.42 in Chingleput and 1.53 in the Nilgiris district. Madras City recorded a rate of 4.55. The other towns that recorded high death rates were Kodaikanal (6.0), Chingleput (5.0), Tuticorin (4.4), Kancheepuram (4.1) and Vellore (4.1). The mortality was the highest in the last quarter and lowest in the third quarter.

TUBERCULOSIS.

The curative and preventive medical care of tuberculosis is under the administrative control of the Medical Department. A brief summary of the activities of the Medical Department is given hereunder.

The work of the Government Tuberculosis Institute at Madras consists of diagnosis and treatment of pulmonary tuberculosis, pre and post sanatorium treatment and periodical check up of arrested cases. For the purpose of early diagnosis among the contacts, 454 houses were visited by Medical Officers and 98 contacts were found to be suffering from tuberculosis. The Health Visitors attached to the Institute visited 1,592 houses and instructed the patients and their relatives regarding isolation of patients, disposal of sputum, care of patient's clothes and utensils. The mass miniature radiography unit was employed to detect early cases of tuberculosis among selected groups of school and college students, police personnel and factory workers. Out of 17,656 X-rayed, 192 tuberculosis cases were detected.

The four clinics attached to the four Government Hospitals in the Madras City catered to the needs of their areas. The work by the clinics was supervised by the Director of the Tuberculosis Institute. The staff of these clinics visited houses to examine the contacts.

The health staff carried out health education on tuberculosis and advised the people to take prompt treatment in medical institutions.

The mass B.C.G. vaccination campaign in Madurai and Tiruchirappalli districts was completed. The field teams moved into the districts of Tirunelveli and Kanyakumari. The vaccination campaign has so far been completed in all other districts except Chingleput district and was in progress in Tirunelveli and Kanyakumari districts. During the year under report 1,272,770 persons were tuberculin tested and 369,886 persons were vaccinated, bringing the total number tested to 5,128,144 and the number vaccinated to 1,665,263. During the year under report 17,145 talks, 717 meetings and 1,578 film shows were organised and two exhibitions were conducted.

Training was given for four weeks in the technique of tuberculin testing and B.C.G. Vaccination to certain Sanitary Inspectors from municipalities in two batches by the Units.

In municipal areas for which mortality from pulmonary tuberculosis is available, there were 2,865 deaths from this disease, giving a death rate of 0.44 in 1960 as against 3,069 with a rate of 0.51 in 1959. The towns that recorded high death rates from pulmonary tuberculosis are Kodaikanal (5.5), Periyakulam (2.7), Madurai and Salem (1.3).

INFLUENZA.

There was no epidemic of influenza, but a few mild cases of influenza were reported from some parts of the State and treated in the local hospitals.

KALA-AZAR.

The continuance of the Kala-azar research scheme was not sanctioned. The services of the trained attenders were therefore utilised for the check up survey of the guinea-worm endemic area under Guinea-worm Eradication Programme.

The epidemiological and entomological aspects of Kala-azar and Guinea-worm diseases were demonstrated to the students of the Madras Medical College, Vellore Medical College, Kilpauk Medical College and Madurai Medical College.

GUINEAWORM ERADICATION PROGRAMME.

The Statewide Guinea Worm Eradication Programme initiated in 1959, was continued. The disease was prevalent in all the districts except the Nilgiris, Tirunelveli, Kanyakumari and most of the areas in Chingleput district. It is endemic in South Arcot and North Arcot districts, occurs in epidemics in Tiruchrappalli and Madurai districts and mild in other districts. These areas are divided into six zones, each under a unit headed by an Entomological Assistant. The six units were stationed at Villupuram, Tirukoilur, Polur, Tiruchirappalli, Madurai and Bhavani. The work done by these units is tabulated in Annexure X. The drinking water sources in the infected and surrounding villages were treated with chemicals. The quantity of chemicals used was 17,601 lbs. of D.D.T., 10,325 lbs. of Gam-mexane D. 120 and 51,364 lbs. of stable bleaching powder.

As a few pockets only infected in Chingleput district, survey and treatment work was undertaken by the Research Staff at Madras. Seven hundred and thirty-one villages were surveyed and four cases were recorded in four villages. The prevalence rate is very low when compared to the other districts. However, treatment of water sources was carried out systematically. Intensive education was undertaken by all the units. The villagers were advised to filter the drinking water with double fold cloth or boil it. The dangers of contaminating the drinking water sources were explained to the infected persons. The people are ignorant about the cause and prevention of this disease and hence effective education is essential. For this purpose, sanction was accorded for the purchase of a cinema projector, generator and a vehicle fitted with loudspeakers, production of a film on the subject and also for the appointment of a Cinema Operator.

Under the Guineaworm Eradication Programme, provision was made for only 55 Field Assistants, each to be in-charge of 15 to 20 villages. On this basis, only about 900 to 1,000 villages could be covered by them. But it is found on implementation of the programme that about 1,920 villages have to be covered. Hence about 120 Field Assistants are required, if the water sources are to be treated with chemicals periodically and systematically according to the time schedule. This is necessary if the eradication measures are to be successful.

LEPROSY.

Leprosy institutions in the State continued to be under the control of the Medical Department. The activities of the Department are detailed below :—

Fourteen Leprosy Centres continued to function. A leprosy colony with 25 beds at Elathur, North Arcot district, was opened. The Leprosy Centre at Polambakkam, Chingleput district, run by the Belgium authorities, was taken over by the Government. This centre covers an area of 80 sq. miles with a population of five lakhs. It is proposed to run this by private management with full grants from the State.

The Hindu Kusht Nivaran Sangh, Madras, is entrusted with the welfare and publicity work on leprosy. The Sangh has a publicity van fitted up with public address system, projectors, tape recorder, etc. The Honorary Secretary of the Sangh visited the leprosy centres in South Arcot, North Arcot, Salem and Coimbatore districts and organised public meetings and film shows to educate the people on leprosy and its prevention. He helped several voluntary organisations to take up planned leprosy control

work. The Sangh participated in the All-India Khadi Exhibition, Madras, and in the celebration of the World Leprosy Day on 30th January 1960. It published two pamphlets on "What you should know about Leprosy" in English and "Kushta Rogathaippatri" in Tamil and one coloured poster in Tamil. These and other publicity materials with the Sangh were distributed to leprosy control centres.

The health staff undertook preventive measures. Leprosy surveys were conducted in 333 villages in five districts and Poonamallee Health Unit area and in seven municipalities and detected 5,832 cases (2,201 lepromatous and 3,631 Non-lepromatous). The patients were advised to take treatment in the nearest hospitals, clinics, subsidiary and primary health centres. During their visits to villages, the health staff educated the people explaining the nature of the disease, the necessity for early treatment and segregation of the infected persons from the children.

Twenty-eight Health Inspectors of Primary Health Centres, Sanitary Inspectors of municipalities and panchayat boards and Health Assistants were trained in leprosy prevention and control in the three leprosy institutions in the State.

VENEREAL DISEASES.

The Venereal Diseases clinics and institutions in the State are under the administrative control of the Medical Department. The Serology section of the King Institute, Gundy, performed 52,746 tests for diagnosis of syphilis. Of these 5,455 were positive. In respect of all these positive cases, V.D.R.L. microflocculation and quantitative tests were also undertaken.

The public health staff carried out education on venereal diseases during their visits to the villages and advised the patients to go to the nearest clinics or hospitals for treatment.

The Madurai Municipal Council is now running two Venereal Diseases clinics which continued to do useful work in the control of venereal diseases. Special care and routine treatment was given to ante-natal cases referred from the maternity homes of the municipality. Out of 15,670 cases examined for V.D.R.L. test, 1,458 proved positive. The contacts of positive cases were followed up for periodical check up and given regular course of treatment. 15,451 persons (6,703 males, 8,744 females and 4 children) were treated at the clinics.

YAWS CONTROL.

Yaws Surveillance Unit.—The prevalence of yaws in Avanashi and Palladam taluks of Coimbatore district was controlled by the survey and treatment carried out in these areas in the previous years. However, in order to prevent the spread of the disease from the cases which escaped treatment, a surveillance unit is maintained since 1959. The surveillance work was continued in Avanashi taluk till August 1960 and then taken up in Palladam taluk. The work consisted mainly of detecting cases of yaws and treating them. Besides this, minor ailments like scabies, conjunctivitis, Otitis etc., were also treated. Out of 10,459 persons examined in 3,782 houses, 330 cases were detected. These cases, cases detected previously but not treated, latent cases and contacts, numbering 615 (302 males and 313

females) were treated with P.A.M. A quantity of 1,795 c.cs of P.A.M. was spent for the treatment. The following statement shows the clinical data of treated cases.

Name of the Unit.	Active cases.			Inactive late yaws.	Total.
	Infectious.	Non-infectious.			
		Hyper.	Late.		
(1)	(2)	(3)	(4)	(5)	(6)
Yaws Surveillance Unit, Palladam.	2	192	138	293	615

Yaws Control Units.—The Government sanctioned a centrally sponsored Yaws Control Scheme in April 1960. Two units were established one at Perundurai and the other at Uthukkuli of Erode Taluk, Coimbatore district, under the direct charge of the Research Health Officer at Madras. The staff for each unit consists of one Assistant Surgeon, one Health Inspector, one Health Assistant, one peon and a driver. Owing to dearth of medical candidates, the Assistant Surgeons only were not appointed. Necessary drugs and stores were supplied to the units for treatment of cases. Two jeeps were purchased for the quick transportation of the team so as to carry out the work quickly and efficiently.

The control units examined 62,589 persons in 14,375 structures in 699 villages including hamlets and detected 1,425 cases of yaws of which 29 were active infectious. All the cases and their contacts were treated with P.A.M.

The following statement shows the clinical data of the treated cases including those detected previously but not treated:—

		Active cases.			Inactive Late Yaws.	Number of latent yaws and contacts.	Total.
		Infectious. (2)	Non-infectious.				
			Hyper.	Late.			
(1)		(2)	(3)	(4)	(5)	(6)	(7)
Uthukuli	.. .. .	49	107	143	127	72	498
Perundurai	.. .. .	7	99	112	32	33	283
Total		56	206	255	159	105	781

As the Assistant Surgeons were not appointed, the Research Health Officer treated the cases during his visits to the units. Therefore only 781 cases could be treated. The quantity of P.A.M. used was 2,536.5 c.cs. As all the cases detected have not been treated, the scheme is being continued. Since lack of cleanliness forms the main factor in spreading the disease easily, the Government sanctioned Rs. 5,000 for the purchase of soaps for distribution among the cases of yaws and contacts.

Besides survey and treatment work, patients suffering from itches, conjunctivitis, etc., were also attended to. Health education was carried out in the areas covered by these units.

As the results were encouraging, a scheme for the eradication of yaws from Coimbatore district was submitted to Government for inclusion in the third Five-Year Plan.

DISEASES IN ANIMALS COMMUNICABLE TO HUMAN BEINGS.

With a view to prevent the spread of rabies among human beings, the Veterinary Department inspected lethal chambers maintained by municipalities for destruction of stray dogs. In the clinical department of the Madras

Veterinary College, 154 prophylactic, anti-rabic vaccinations and 128 post infectious vaccinations of dogs were undertaken. People were also advised to get their dogs vaccinated periodically with anti-rabic vaccine.

Steps were taken by the Veterinary Department to control promptly all outbreaks of diseases communicable to human beings. Protective vaccination against anthrax and such other diseases was carried out.

INFECTIOUS DISEASES HOSPITAL.

Isolation and prompt and efficient treatment of patients with infectious diseases are the most important preventive measures in the control of communicable diseases. Therefore it is necessary that isolation hospitals should be provided. A scheme for construction of infectious diseases hospitals at 35 centres has been sanctioned, whereby the Government propose to pay grants upto 50 per cent non-recurring cost and to the extent necessary in respect of maintenance cost to the concerned local bodies which undertake the construction of such hospitals in the centres selected. In 1960, the Government sanctioned a half grant of Rs. 1,505 to the Periyakulam Municipal Council for the construction of an infectious diseases hospital.

CHAPTER III—HEALTH SERVICES.

MATERNAL AND CHILD HEALTH.

The maternity and child welfare services in rural areas were further augmented considerably in 1960 by the opening of maternity and child welfare centres under the Second Five-Year Plan, Backward Area Scheme and Primary Health Centres and Community Development Programme. The number of Government centres has increased from 975 in 1959 to 1,138 centres in 1960. The local bodies maintained 578 centres in 1960 as against 570 in 1959. The increase in the number of centres under local bodies was eight only, as several requests from local bodies had to be turned down owing to financial considerations. The voluntary agencies also helped in extending the maternal and child health services, as the number of their centres increased to 229 in 1960 from 208 in 1959.

Backward Area Scheme.—The 19 maternity and child welfare main centres with four sub-centres attached to each opened during 1955-56 with the staff of one Health Visitor and one Ayah for the main centre and one Maternity Assistant and one Ayah for sub-centres under the Backward Area Scheme continued to function. The entire expenditure on this scheme was borne from the State Funds. This scheme benefits a population of 114,000.

Second Five-Year Plan.—During the year under report, 96 maternity and child welfare centres were opened as per plan programme. All the 499 centres proposed under the Second Five-Year plan have thus been opened. Each centre was staffed with one Maternity Assistant and an Ayah. A total population of 1,966,900 is benefited under this scheme.

There were 1,945 maternity and child welfare centres (including maternity homes) in 1960 under all agencies as against 1,759 in 1959. The centres and

homes maintained by Government, local bodies, the Corporation of Madras and voluntary organisations are shown in the following statement:—

Agency.	Homes.		Centres.		Without beds.	Total number of Maternity homes and Maternal and Child-welfare centres.
	Number.	Bed strength.	Number.	Bed strength.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. Government—						
1 Health Unit, Poonmalles ..	7	32	..	..	1	8
2 Backward Area Scheme ..	..	..	12	12	83	95
3 Second Five-Year Plan ..	..	..	..	..	489	489
4 Primary Health Centres ..	..	..	..	..	484	484
5 P.W.R. Converted into Primary Health Centres.	..	..	..	..	33	33
6 Kanyakumari ..	..	..	..	..	26	26
7 Women Welfare Board ..	..	..	..	..	3	3
Total ..	7	32	12	12	1,119	1,138
II. Local Bodies—						
1 District Boards (inclusive of Panchayats).	9	66	46	114	275	330
2 Municipalities ..	44	519	40	136	121	205
3 Corporation ..	19	272	..	..	24	43
Total ..	72	857	86	250	420	578
III. Voluntary Agencies—						
(Private and Aided) ..	39	465	80	214	110	229
Grand total ..	118	1,354	178	476	1,649	1,945

Of these 1,945 centres and homes, 1,659 are located in the rural areas and 286 in urban areas. As maternal and child health services in rural areas are very inadequate, the Government have opened centres in rural areas only.

Staff.—The sanctioned strength of maternity and child welfare staff employed by all agencies is shown hereunder:—

Agency.	Women Medical Officers.		Resident Matrons.		Health Visitors.		Maternity Assistants.	
	At the end of 1959	At the end of 1960.	At the end of 1959	At the end of 1960.	At the end of 1959	At the end of 1960.	At the end of 1959	At the end of 1960
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 Government ..	3	3	3	3	143	144	1,039	1,130
2 District Boards ..	15	15	2	2	17	17	469	475
3 Municipalities ..	45	46	13	13	49	51	445	453
4 Corporation ..	31	31	16	16	88	88	290	290
5 Voluntary Agencies..	15	18	..	..	1	1	263	240
Total ..	109	113	34	34	298	301	2,506	2,588

The distribution of maternity and child welfare staff in rural and urban areas, in each district is given in annexure K. There are now, 1,763 Maternity Assistants and 161 Health Visitors in rural areas and 825 Maternity Assistants and 140 Health Visitors in urban areas.

One post of Woman Medical Officer was sanctioned for Tiruppur Municipality and voluntary organisations employed three in addition to those in 1959. The total number of Women Medical Officers therefore was 113. All District Boards except North Arcot, Tirunelveli, Kanyakumari and the Nilgiris had sanctioned posts of Women Medical Officers.

There was no change in the number of Resident Matrons (34) under all agencies. The number of sanctioned posts of Health Visitors increased from 298 in 1959 to 301 in 1960.

The total number of Maternity Assistants under all agencies was 2,588 in 1960 as against 2,506 in 1959.

Out-turn of work.—The total number of mothers brought under care, home visits made, clinics conducted, number of mothers' classes held, lantern lectures given and schools visited for health education, etc., by the maternity and child welfare staff are furnished in Annexure J. Compared to 1959, there was an increase in the number of expectant and nursing mothers and infants brought under care. The number of clinics held also increased from 12,843 in 1959 to 81,920 in 1960 with the result that more expectant mothers and infants were examined. The minimum number of labour cases to be conducted by a Maternity Assistant has been increased from 10 to 13 in rural and 12 to 15 in urban areas.

The percentage of births attended to by the Maternity Assistants in districts exclusive of municipalities was 19.9, that in municipalities was 40.5 and in the State as a whole was 25.6 as against 17.7, 43.0 and 24.2 in 1959 respectively.

Voluntary Organisations.—The voluntary organisations, namely, Social Welfare Extension Projects, Avvai Rural Medical Services, Kasturba Gandhi National Memorial Trust and Velacheri Welfare Association, continued to render maternity and child welfare services by maintaining 190 Centres and 39 Homes as against 175 Centres and 33 Homes in 1959.)

UNICEF supply of Drugs and Diet Supplements.—Useful drugs, such as, Piperazine for treating worm infestation commonly met with in children, Ferrous sulphate, calcium lactate, Entero-vioform, sulfaguanidine for combating intestinal flux and dysentery, triple sulpha for infections and food supplements of Vitamin A and D capsules for infants and mothers, have been gifted by the UNICEF for free distribution through Maternal and Child Health Centres. Kit boxes for use in maternity work have also been supplied. The drugs, food supplements, etc., were stored in a godown at Madras. They were distributed to all Maternal and Child Health Centres in 1960.

On a suggestion from the UNICEF, the indent and supply of drugs and diet supplements to Primary Health Centres also has been undertaken by this Department. Drugs and diet supplements worth about Rs. 37,610.74 released by them were distributed to the Primary Health Centres in the State.

FINANCE.

A sum of Rs. 30.14 lakhs was spent on maternal and child health services by all the local bodies representing 2.04 per cent of total income. The municipalities and the Corporation spent Rs. 24.21 lakhs and the district boards Rs. 5.93 lakhs on this activity. The expenditure on maternity and child welfare services by Government under the Second Five-Year Plan and backward area schemes is Rs. 12.47 lakhs. A sum of Rs. 4.3 lakhs was also paid by Government towards maintenance grant for maternal and child health services during the year to all local bodies except the Corporation and to the Avvai Rural Medical Services.

TRAINING PROGRAMME.

Thayis Training Scheme.—During the year under report 800 thayis of the last batch under the Second Five-Year Plan were trained as against the target of 900 for 1960-61. This brought the total number of thayis trained to 3,200 as against the target of 3,600. As usual, thayis kit costing about Rs. 50 was given free to each thayi trainee. In addition to this, a cash reward not exceeding Rs. 30 per mensem was also paid to each on case basis system at 75 nP. for each ante and post natal case and Rs. 3 for each labour case. The expenditure on the scheme was Rs. 2.04 lakhs in 1960-61.

An employment scheme for trained thayis at an estimated cost of Rs. 6 lakhs is under consideration of Government. Under this scheme not more than 10 trained thayis will be attached to each Maternity Centre and each thayi will be paid Rs. 3 per delivery case conducted by them subject to a minimum of Rs. 10 and a maximum of Rs. 15 and will be supplied with refills at a cost of Re.1 for each delivery case conducted. Three thousand and three hundred thayis are estimated to be utilised under this scheme.

Health Visitor's Training.—Government have ordered that 16 per cent of the seats for admission to the Health Visitor's Course should be reserved for the Harijan candidates. Twenty-five students were recruited in July 1960 under the Regular State Scheme. Twenty-six students recruited in July 1959 have passed out at the end of 1960.

The Manual on Maternal and Child Health in Tamil prepared by Dr. R. Visalakshi, Medical Officer (Maternal and Child Health), Government Training School for Health Visitors, Madras, was scrutinised by a committee and approved by Government. Out of 3,000 copies of the Manual printed, 2,000 are intended for departmental use and 1,000 for sale. Each copy is priced at Rs. 1.65 nP.

FAMILY PLANNING.

The Family Planning Clinic at Poonamallee continued to serve the entire population of the unit area. The details of the work done are given under the heading "Health Unit, Poonamallee" in this chapter.

Copies of Family Planning Manual in Tamil and in English were distributed free of cost to Health Inspectors, Sanitary Inspectors, Women Medical Officers, Resident Matrons, Health Visitors and Maternity Assistants so that they might be educated on all technical details of the subject.

The Maternity Assistants and the Health Visitors working in municipalities introduced the Family Planning Nurses of the Hospitals to the members of the family during their home visits to enable them to carry on education

in family planning. The Health Visitors, Maternity Assistants and Health inspectors advised the persons with whom they came into contact during the course of their duties to adopt the surgical methods of family planning and to avail themselves of the facilities offered by Government for this purpose. One hundred and twenty-three talks on family planning were given by the Women Medical Officers during clinics. In all, 119 sterilisations were done in some municipalities on the advice of the public health staff. The programme for the Family Planning Day on 18th December 1960 was carried out in several maternity and child welfare centres. Souvenir specially brought out in this connection and pamphlets on surgical methods were distributed at the public and public meetings were held.

A post of social worker was sanctioned for the Family Planning Centre at Seethalakshmi Maternity Home, Coimbatore.

The proposal to train the Health Inspectors employed in Primary Health centres in family planning was approved by Government. The Director of Medical Services has been requested to prepare detailed proposals regarding their training, the duties to be entrusted to them, etc.

MATERNAL MORTALITY.

The steady decline in the number of deaths due to child-birth since 1956 has been maintained and the maternal mortality rate of 3.46 per 1,000 live and still births in 1960 is the lowest on record. The mortality figures for the State since 1956 are shown below:—

							Maternal Mortality.	
Year.							Number of Maternal deaths.	Rate per 1,000 live and still births.
(1)							(2)	(3)
1956	..	..	..	..	..	..	4,503	5.0
1957	..	..	..	..	..	..	4,020	4.6
1958	..	..	..	..	..	..	3,795	4.2
1959	..	..	..	..	..	..	3,742	3.9
1960	..	..	..	..	..	..	3,165	3.5

The fall in the maternal deaths as compared with 1959 is also observed in all the areas of the State as shown hereunder.

					1959.		1960.	
Area.					Number of maternal deaths.	Rate per 1,000 of live and still births.	Number of maternal deaths.	Rate per 1,000 of live and still births.
(1)					(2)	(3)	(4)	(5)
State	..	..	..	..	3,742	3.9	3,165	3.5
Rural	..	..	..	..	2,270	3.3	1,875	3.2
Urban	..	..	..	..	1,472	4.3	1,290	3.9
Municipal Towns			..	..	1,043	4.1	1,021	3.9
Census Towns	..	..	..	..	429	5.8	269	4.0

The number of deaths due to child births and the death rate registered in each district are given in Statement II of the appendix. The rate varied from 5 in North Arcot district to 4.7 in Thanjavur and Tiruchirappalli. Government and private institutions are higher than in non-officers. The private institutions

except Tiruchirappalli and Kanyakumari districts. Although the ante-natal and intra-natal care is better in the municipal areas, the higher rates recorded in municipal areas is probably due to better registration of maternal deaths in municipal areas. Statement VI of the appendix gives the number of maternal deaths and the death-rate in each municipal town. The towns that registered high maternal mortality rates were Palayamkottai (15.1), Gobichetti-palayam (12.9), Tiruvannamalai (12.1), Kancheepuram (11.8) and Cuddalore (10.4).

INFANT MORTALITY.

The number of infant deaths has decreased from 86,151 in 1959 to 82,439 in 1960, the infant mortality rates being 91.09 and 91.59 per 1,000 live births respectively. The infant mortality rates recorded during the past decade show a downward trend, as will be seen from the following statement and chart No. 2.

Year.	Infant Mortality Rate.	Year.	Infant Mortality Rate.
(1)	(2)	(1)	(2)
1950	129.6	1956	117.0
1951	120.5	1957	110.7
1952	103.3	1958	103.4
1953	119.4	1959	91.1
1954	105.6	1960	91.6
1955	107.8		

The infant mortality recorded in the different areas during 1960 as compared with 1959 is given below:—

Area.	Infant deaths.			
	1959.		1960.	
	Number.	Rate.	Number.	Rate.
(1)	(2)	(3)	(4)	(5)
State	86,151	91.1	82,439	91.6
Rural	57,795	91.7	55,479	95.1
Urban	28,356	89.9	26,960	85.2
Municipal Towns	23,126	95.1	22,233	88.8
Census Towns	5,230	72.5	4,727	72.4

In urban areas, the infant mortality rate has slightly decreased while in rural areas there has been a small increase. It may however be noted that the number of infant deaths is less in all areas than in the previous year.

The death rates in the age groups under one year are shown hereunder:—

Age group.	Rural Areas.	Urban Areas.	State
Under 1 week	9.1	23.7	14.2
1 week and under 1 month	34.8	15.0	27.9
1 month and under 6 months	21.1	22.5	21.6
6 months and under 12 months	30.2	23.9	28.0
Total under 1 year	95.1	85.2	91.6

Officers, they might be expected, as skilled aid at birth is common in rural areas.

The Maternity Assistants introduced the Family Planning rate (death-rate under one month) in urban areas.

areas is less than that in rural areas. It is also less than the rate of 42.9 in 1959 for the State. The neo-natal deaths represent 46 per cent of the total infant deaths as against 47 per cent in 1959, while those in the age period 1-12 months form 54 per cent. This is in contrast to the conditions in advanced countries where the mortality rate in the age-group 1-12 months is only a fourth of the rate of the neo-natal death-rate. This shows that there is scope for reduction in the infant mortality in the post neo-natal period.

As in the previous year, the number of infant deaths represented nearly one-fifth of the total number of deaths at all ages.

In annexure E, the infant deaths and the infant mortality rate recorded in each district, district exclusive of municipal towns and in all municipal towns in each district are given. In Statement IV of the appendix, the infant deaths in rural and urban areas in each district are furnished, while in Statement IV (a) infant mortality rates recorded in each municipality as per community are given. The rate ranged from 56.0 in Kanyakumari district to 112.6 in Tirunelveli district. The low rates of 17.1, 29.2, 32.8 and 39.8 in Kuzhithurai, Arkonam, Nagercoil and Virudhunagar municipalities are mainly due to defective registration. The municipalities of Tiruvottiyur (226.0), Gudiyattam (136.6), Kodaikanal (134.0) and Madras (121.6) returned high infant mortality rates. The very high rate in Tiruvottiyur is not real, as most of births occur in the hospitals in Madras and are registered there.

The infant mortality rates among the Hindus, the Muslims and the Christians in all municipal areas were 88.4, 105.5 and 69.2 respectively. As usual, the rate was low in the Christian community.

MEDICAL INSPECTION OF SCHOOL AND COLLEGE STUDENTS.

A summary of the report on medical inspection of school and college students by the Director of Public Instructions is given below:—

The Corporation of Madras alone undertook medical inspection of children in their 295 Elementary and 84 Basic schools. During the year, 9,511 boys and 14,070 girls were examined and of these, 3,536 boys and 3,689 girls required medical treatment. Malnourished children were given midday meals, shark liver oil, calcium lactate, while others were given necessary treatment in their dispensaries or Government hospitals. As far as Secondary schools are concerned, the managements of 190 schools for boys and 37 schools for girls arranged for medical inspection of their pupils by collecting a special fee for the purpose.

As per the University regulations, medical inspection of students of the Pre-university and of the first year of the degree course is compulsory. The defects in the pupils were brought to the notice of their parents for arranging treatment. Government have introduced a scheme of medical attendance to students in four of their colleges at Madras, Kumbakonam and Coimbatore. A clinic is attached to each college and a part-time medical officer appointed to carry out medical inspection of the students and attend to their medical need.

The Chief Inspector of Approved Schools has reported that there were five Government and 14 private Approved Schools and two Government and six private Reception Homes functioning under the Madras Children Act, 1920. Small hospitals or dispensaries are attached to Government Schools and Homes with whole time or part time medical officers. The private institutions

have arranged medical attendance commensurate with their financial resources. The sanitary arrangements in Government institutions and provision of water-supply in all schools are reported to be generally satisfactory. Out of 4,956 children in all these institutions, the average daily number who fell ill was 29.0 as against 13.4 in 1959. The increase in sickness is stated to be due to prevalence of chicken-pox which was controlled by the Medical Officers. Fifteen deaths occurred among the children in 1960, of which one was due to abdominal tuberculosis and another to T.B. Meningitis. The health of the children is reported to be good. Out of 792 pupils discharged during the year, none lost weight.

VIGILANCE INSTITUTIONS.

The Chief Inspector of Approved Schools and Vigilance Service has stated that there are five long stay and 10 short stay vigilance institutions run by Government and private agencies in Madras City and mufassal. The sanitary arrangements and water-supply in these institutions were satisfactory. Those who were suffering from venereal diseases were given necessary medical treatment.

INDUSTRIAL HYGIENE.

All Health Officers who are Additional Inspectors of Factories inspected the factories in their jurisdictions twice during the year, 1,794 in the first half-year and 1,581 in the second. The observations of the Health Officers with reference to ventilation, lighting, overcrowding, water-supply, etc., in factories were reported to the respective Inspectors of Factories for further action under the Factories Act. The Chief Inspector of Factories has reported that sanitation was satisfactory and that supply of wholesome water was adequate and hygienic. Steps were taken to mitigate dust nuisance in textile and decorticating factories and to prevent inhalation of dust by employees. The managements of factories implemented the suggestions regarding fencing of dangerous parts of machinery to prevent accidents. Most of the factories have provided first-aid boxes or cupboards. Some factories which do not come under the Employees State Insurance Scheme have provided medical facilities to their workers. The Chief Inspector has reported that although attention was paid to protect the workers against industrial diseases, the appointment of separate Medical Inspectors of Factories was necessary. The housing of employees has not been generally satisfactory.

RESIDENTIAL AND INDUSTRIAL AREAS.

Forty-seven municipalities and seventy panchayats have notified residential areas under section 89 of the Madras Public Health Act, 1939. Every urban local authority should notify residential areas within one year after the commencement of the Act. Although two decades have passed residential areas have yet to be declared in the case of 17 municipalities and 74 panchayats. They should notify such areas immediately as otherwise the purposes of statutory provisions will be defeated.

Twenty proposals for exclusion of areas from notified residential areas received from local bodies were approved.

Almost all the municipalities and a large number of panchayats have set apart industrial areas. Proposals for industrial areas in the erstwhile Kuriichi and Ambur municipalities and those for declaration of additional industrial areas from nine municipalities and panchayats were approved during the year.

HOUSING.

The Director of Town-Planning has reported that all layouts for public housing and slum clearance except those for Police Department were prepared by the Town Planning Department. The local bodies were mainly concerned with low income group housing scheme. Some big municipalities, the Corporation of Madras and the Madras City Improvement Trust undertook several housing and slum clearance schemes. Layouts for an area covering 1,812.8 acres comprising 21,698 house sites were prepared in 1960.

HEALTH EDUCATION.

The Government of India recommended a scheme for the establishment of Health Education Bureaux in the States and also offered financial assistance in the second plan period to the extent of 50 per cent of the actual recurring expenditure or Rs. 49,770 whichever was less and a share of the non-recurring expenditure. In February 1960 the Government of Madras upgraded the existing Health Education and Publicity section of this Department into a Health Education Bureau on the lines suggested by the Government of India. An Assistant Director of Public Health in over all charge of the Bureau was posted in October 1960. Till then, the Health Education Officer was in charge of the Bureau. The ministerial staff, the Sub-Editor, Silk Screen Technician, Duplicating Technician and Home Science Assistant were appointed. The Technical Officer who will be in charge of production of materials for audio-visual education, films, models, exhibits, etc., and health education van has not yet been appointed. He will work under the Assistant Director of the Bureau and organise exhibitions with the technicians under him. The Sub-Editor who has just finished his initial training in health education will work under the Technical Officer and be responsible for publication of the "Public Health Abstracts and Reviews", "Public Health Department News" every month highlighting the activities and achievements of all the branches of the Public Health Department.

The Health Education Officer has been posted to Poonamallee to organise the Field Study and Demonstration Centre of the Bureau at Poonamallee. Its activities will extend over the Health Unit area and the Poonamallee Community Development Block and the areas where the Research-cum-Action Project is functioning and Avadi Primary Health Centre, as the centre has to work in collaboration with the Research-cum-Action Project, Orientation Training Centre and the Health Unit, Poonamallee.

The aim of the Field Study and Demonstration Centre is to train the staff of the Centre itself and organise health education activities for selected public health programmes in the areas served by all Primary Health Centres and the Health Unit by working with the staff of the Primary Health Centre and the Block and then use the area for field training and demonstration purposes. In this connection, the Director of Medical Services and the Joint Development Commissioner were addressed for enlisting the co-operation of the Medical and Development departments. The Field Study and Demonstration Centre will also serve as a "Field Laboratory" where problems connected with health education can be referred for testing and evaluation.

A comprehensive programme for health education of the people in connection with the Smallpox Eradication Pilot Scheme in Chingleput district was drawn up and implemented from April 1960 onwards. Health education was carried out mainly through the personnel of the Community Development

Blocks and the Primary Health Centres. Hence training sessions in health education for this programme in each block were conducted. The training session consisted of a panel or group discussion or exhibition of a film followed by a discussion giving information on smallpox to all the block workers. Later the block workers evolved their own plan for health education in their block for this programme.

A film library where 16 m.m. health films are stocked for circulation to local bodies and other organisations on hire at a nominal rate of Rs. 2 per reel per week is maintained. Two 16 m.m. films on "Chinna-papa" in Tamil were purchased and two 16 m.m. films "Mosquito Menace", "Eradicate the Enemy" were received from the Director-General of Health Services, New Delhi, free of cost. These four films were added to the existing film library during 1960. One hundred and seventy-three films were lent to local bodies and others on hire and non-hire basis.

Health films were supplied to all the Rural Extension Training Centres without hire and incidental charges for packing, transporting, etc.

Leaflets on "Smallpox" and "Encephalitis", hand bills and posters on smallpox, tuberculosis and vital statistics and folders on "Malaria Eradication—a World Challenge" were printed. Copies of these were distributed to the public through the Municipal and District Health Officers, Medical Officers of Primary Health Centres and the Principals of Rural Extension Training Centres and the public health staff.

Exhibits like models, charts, paintings, etc., were lent to the Municipal Health Officers of Madurai, Cuddalore and Tirunelveli, the District Health Officer of the Nilgiris district, Health Officer, Health Unit, Poonamallee District Medical Officer, Tirunelveli district and the Director of Information and Publicity for organising exhibitions during festivals, conferences, etc. The Health Education Bureau itself organised exhibitions in collaboration with the Madras Medical College on World Health Day and the festival at Tiruthani.

Oil painting posters on "Good Habits" were lent to the "Children's Corner" in the All-India Khadi and Village Industries Exhibition held at Teynampet, Madras, during 1960-61.

World Health Day, 1960 was celebrated on 18th July in a fitting manner by this department in collaboration with Medical Officers, Revenue Officers, Educational authorities, local bodies and others throughout the State. The theme chosen for World Health Day was "Malaria Eradication—a World Challenge". The "National Cleanliness Day" was also celebrated on 2nd October 1960 throughout the State in collaboration with the district boards, municipalities and panchayats and social welfare organisations.

The Health Education and Publicity van with all cine equipment and staff was deputed to Cuddalore for health education work on Mass Hetrazan Therapy and also in connection with the Hospital Day Celebration and to Chingleput district in connection with the health education work for the smallpox eradication programme. The van was utilised for work in connection with the World Health Day celebration. The van and the staff toured almost all the villages in Chingleput district to carry out intensive health education in that area. Film shows on the prevention and control of smallpox were conducted.

A summary of the activities of health education and publicity work done by the health staff in 1960 is furnished below :—

1 Lectures (with and without magic lantern)	.. ..	10,558
2 Talks	.. ..	54,575
3 Exhibitions	.. ..	293
4 Cinema Shows	.. ..	1,939
5 Health Dramas	.. ..	46
6 Others	.. ..	2,561
7 Audience	.. ..	4,154,497
8 Number of lectures on health subjects	.. ..	47,396
9 Number of pamphlets distributed	.. ..	211,373

Equipments from the UNICEF for the preparation of audio-visual materials were received and tested. Some of the equipments intended for training will be made use of in the Field Study and Demonstration Centre. Two hundred and thirteen books on Health Education, Sociology and Public Health have also been received and are lent to all officers.

The Health Education Consultant assigned by the T.C.M. continued to give help and guidance in the organisation of the Health Education Bureau.

STATE HEALTH EDUCATION COUNCIL.

Government have sanctioned the constitution of a State Health Education Council with official and non-official members as suggested in the Central Schemes for the establishment of Health Education Bureau in the States. The main function of this Council is to co-ordinate and support the activities of the Health Education Bureau.

PRIMARY HEALTH CENTRES AND HEALTH SCHEMES UNDER SECOND FIVE-YEAR PLAN.

During 1960, there were 118 Primary Health Centres functioning with full complement of staff. They are under the control of the Medical Department. Consequent on the introduction of the Madras Panchayats Act, 1958, the State will ultimately be divided into 374 Panchayat Unions, each being co-terminous with Development Block. In October, 75 Panchayat Unions were established. The Health Inspectors working in the Primary Health Centres have been treated as the Health Inspectors for the Panchayat Unions. In all the Development Blocks whether there are Primary Health Centres or not, the range Health Inspectors are attending to public health activities. Public health activities were also carried out in Gramdhan villages.

The following 10 Second Five-Year Plan schemes were being implemented :—

1. Mobile Epidemic Unit.
2. Environmental Hygiene.
3. Maternity and Child Health Services.
4. Health Education and Publicity Health Education Bureau.
5. Training of Health Visitors.
6. Registration of Births and Deaths in Kanyakumari district.
7. National Malaria Eradication Programme.

8. National Filaria Control Programme.
9. B.C.G. Vaccination Campaign.
10. Training of Thayis.

Details of the progress made under each scheme are given in the relevant subjects in this report. The expenditure incurred on the schemes during the year and the Plan provisions are furnished below :—

The Statement of Expenditure for Second Plan Schemes.

Name of the scheme.	Plan provision.	Actuals for four years 1956-60.	Departmental Actuals for 1960-61.	Total.
(1)	(2)	(3)	(4)	(5)
				RUPEES IN LAKHS.
1 Mobile Epidemic Unit	3.75	1.76	0.28	2.04
2 Environmental Hygiene	6.14	2.60	0.36	2.96
3 Maternal and Child Health Services.. ..	17.93	12.87	8.54	21.41
4 Health Education and Publicity and Health Education Bureau.	6.40	1.89	0.67	2.56
5 School Medical Inspection	8.39	0.01	Scheme deferred.	0.01
6 Training of Health Visitors	3.14	1.10	0.02	1.12
7 Opening of training Centre for Auxiliary Health workers.	2.35	Scheme deferred.		
8 Registration of births and deaths in Kanyakumari district.	1.19	0.88	0.25	1.13
9 National Filaria Control Programme* ..	33.15	a 136.03 b 53.81 c 82.22	145.24 110.64 34.60	231.27 164.45 118.82
10 National Filaria Control Programme ..	32.39	a 17.58 b 10.16 c 7.43	3.18 .. 3.18	20.76 10.15 10.61
11 B.C.G. Vaccination Campaign	11.50	a 11.49 b 0.84 c 10.65	3.86 0.50 3.36	15.35 1.34 14.01
12 Training of Thayis	0.24	a 3.70 b 3.63 c 0.07	1.69 1.63 0.06	5.39 5.26 0.13
Total	†126.33	189.91	164.09	354.00

† This does not include the five year provision of Rs. 0.24 lakhs required for training of Thayis (deputed to the head of account 38 Medical).

* Note.—The National Filaria Control Programme has been switched over to National Malaria Eradication programme during 1959. The Central assistance for this scheme is available in the shape of materials and equipments and 50 per cent of the cash subsidy over and above Rs. 8.06 lakhs per year.

- (a) Represents total expenditure.
(b) Represents Central assistance.
(c) Represents State share.

Health Unit, Poonamallee.

The Health Unit, Poonamallee, continued to function as in the previous years. The Unit area comprises 39 revenue villages with a population of 62,833 and extends over 39 sq. miles. Fifty per cent of the expenditure on the staff and other recurring expenditure on Rural Health Centre is borne by the Government of India.

The vital statistics recorded in the Health Unit area are shown below :—

	1959.		1960.	
	Number.	Rate.	Number.	Rate.
(1)	(2)	(3)	(4)	(5)
Births	2,928	43.6	2,801	41.6
Deaths	1,282	19.1	1,199	17.8
Infant deaths	405	138.3	315	112.5
Maternal deaths	2	0.7	1	0.3
Still births	91	30.1	89	30.8

One hundred and nine unregistered births were detected in 1960 as against 123 in 1959. The number of unregistered deaths detected during the year was 157 as against 169 in 1959.

There was no case of cholera. There were two attacks and no death from smallpox in 1960 as against 18 attacks and two deaths in 1959. The two cases were removed to the Infectious Diseases Hospital, Tondiarpet, Madras for treatment. Three thousand six hundred and eighty-eight primary vaccinations and 46,260 re-vaccinations were done as against 3,487 primary vaccinations and 13,907 re-vaccinations in 1959.

Out of 261 tuberculosis cases (164 males and 97 females) who attended the part-time Clinic of the Health Unit, 210 were under treatment and 51 were under observation. There were 13 deaths among them. The age distribution of the cases was as follows :—

Age group.	Number of cases.
0-5 years	15
5-15 years	40
15-20 years	67
Over 25 years	139
	261

The number of clinics held was 50, the average attendance being 43. The number of specimens of sputum examined was 674, of which 101 were positive and the number of X-rays taken was 378. Out of 401 tuberculin tests done, 146 proved positive and 115 B.C.G. vaccinations were performed.

The mass radiography unit attached to the Government Tuberculosis Institute, Madras, was deputed once a month for examination of contacts of tuberculosis cases and 833 contacts were examined. Of the 725 contacts who attended the clinic, 620 were completely examined.

Forty-nine bore well pumps, eight tube wells with pumps and seven public wells with pumps were functioning in the Health Unit area. Two hundred and seventy-six private latrines of the bore hole type with W.S.S. slabs were constructed and 258 old private latrines of this type were reconstructed as compared with 158 and 219 respectively in 1959.

During the year 776 houses were surveyed and 1,783 houses were revisited for rectification of defects. The public health work done is given below :

Number of backyards cleaned	1,003
Number of fly breeding places disposed of	454
Number of mosquito breeding places attended to	502
Number of houses white washed	110
Number of soakage pits dug for disposal of waste water	295
Number of wells chlorinated	1,070

One Health Educator for the Rural Health Centre, Poonamallee, was appointed. Intensive health education for the various health programmes like maternal and child health, family planning, tuberculosis, soil sanitation, small-pox eradication programme, etc., was carried out through individual contacts, mothers' classes, group discussions, public meetings, film shows and lectures in "Mather Sangams," etc. Information sessions were also conducted for the village leaders during the village leaders' camps conducted by the Poonamallee and Kunrathur Blocks for smallpox eradication programme. The health staff along with the Health Educator carried out regular health education. Seven cinema shows, one health exhibition and 1,467 lectures on various health subjects were carried out.

One hundred and sixty-eight pupils in two schools were examined and parents of children with defects were contacted and advised to attend to the defects found in the children immediately. Health talks were given with the help of the school teachers and Health Visitor trainees and medical interneers. Children not protected against smallpox were vaccinated against smallpox.

There were seven Maternity Homes and one Maternal and Child Health Centre in the Unit area. The maternal and child health staff conducted 2,224 labour cases, while the other qualified Maternity Assistants attended to 109 cases. The number of births conducted by trained dais was 229. In all, 91 per cent of the total number of births recorded in the year received skilled assistance. Difficult labour cases were removed to the hospitals at Madras. Thirteen thousand and eighty-four expectant and 20,332 nursing mothers, 6,785 infants and 18,380 pre-school children attended the clinics. The staff also treated minor ailments of 13,133 mothers, 6,091 infants, 18,757 pre-school children and 20,350 persons. Shark liver oil was given to 4,384 mothers, 2,269 infants, 5,601 pre-school children and 3,675 ante-natal cases. The number of house visits made during the year under report by the Medical Officer (Maternal and Child Health) was 835 and those by the Health Visitors and the Maternity Assistants are detailed below :—

	Health visitors.	Maternity Assistants.
Ante-natal	1,833	34,659
Post-natal	..	16,685
Infants	4,294	16,280
Pre-school children	5,858	..

In order to improve the health of pre-school children Government sanctioned the deputation of the Nutrition Officer of this Department once a week and a Paediatrician of the General Hospital at Madras once a fortnight to the unit area. In October well babies up to the age of two years

mostly and a few up to five years were registered. Their growth and development were assessed periodically. Babies with specific ailments were isolated and advised to attend the local hospital. Deserving cases were given iron tablets, calcium tablets, vitamin A and D capsules.

There is a Family Planning Centre with one Woman Medical Officer, one Health Visitor and one Ayah for the Health Unit area. The summary of the work done by the Centre was as hereunder :—

1 Number of persons contacted for family planning education	4,174
2 Number of cases given advice	216
3 Number of active cases following family planning method	273
4 Number of persons visited at home for—	
(a) New contacts	228
(b) follow up	894
5 Cost of contraceptives supplied by the clinic free of cost	218.08 nP
6 Sterilisation cases referred to hospital—	
Males	5
Females	73
Total	78

7 Number actually following the family planning methods—

	Number following.	
(a) Diaphragm and jelly	..	..
(b) Jelly alone	..	4
(c) Sheath	..	16
(d) Safe period	..	2
(e) Foam tablets	..	171
(f) Sponge and foam	..	..
(g) Withdrawal	..	15
	Advised.	Done.
8 Salpingectomy	690	59
9 Vasectomy	48	4
	General.	Group.
10 Number of meetings held	12	175
11 Number of persons attended	725	2,362

TRAINING PROGRAMME.

During the period under report, pupil Health Visitors from the Health Visitors School, Madras, pupil Maternity Assistants and Public Health Nurses from the City State Hospitals, Sanitary Inspector students from the Medical Colleges, Madras, Auxiliary Nurse Midwives from Kasturba Gandhi Hospital, Madras, and the Women Medical Officers undergoing the Diploma Course in Maternal and Child Health in Madras Medical College were deputed to the Health Unit for field training.

The pre-registration medical graduate interneers from the Madras Medical College, Madras, had their internship in the Health Unit, Poonamallee, in batches of about seven to fifteen students every month.

Under the scheme of training of Dais, 48 Dais have so far undergone training successfully to conduct labour cases under hygienic conditions.

Skim milk, soap and fish oil capsules gifted by the UNICEF were distributed to the ante-natal and nursing mothers, pre-school children and infants in the Maternal and Child Health Centres. Skim milk was distributed also to the Tuberculosis patients. A jeep was also given on loan by the UNICEF for use in the Health Unit.

The Health Unit, Poonamallee, has been functioning since 1935 and the Silver Jubilee of the Health Unit was celebrated on 27th December 1960. A health exhibition along with other departments was got up as part of the celebration and a souvenir was also brought out.

A number of visitors both from abroad and India visited the Health Unit.

ORIENTATION TRAINING CENTRE, POONAMALLEE.

The Orientation Training Centre at Poonamallee is now maintained by the State Government. Sanction has been accorded for its continuance up to 28th February 1961. The objective of the Centre is to re-orient doctors and auxiliary health personnel in the philosophy of rural health work and to equip them to discharge their duties efficiently in Primary Health Centres.

In all, 160 health and medical personnel (32 Doctors, 59 Health Inspectors, 20 Health Visitors, 46 Maternity Assistants and three others) underwent the training course in five complete batches in 1960. Since the inception of the Centre, 313 Doctors, 357 Health Inspectors, nine Public Health Nurses, 150 Health Visitors, 394 Maternity Assistants and 14 others were trained. These trainees were deputed from the Health Centres in the States of Madras, Gujarat, Maharashtra, Andhra Pradesh, Mysore and Pondicherry. Kerala State did not depute any team. The Western and Southern Railways felt the need to give this training to their medical and health personnel and deputed one team consisting of one Doctor, one Sanitary Inspector and one Midwife in each batch. Other special categories of personnel—Health Officers, Civil Assistant Surgeons, Instructors in Rural Extension Training Centres, World Health Organization—were also deputed from time to time.

The syllabus issued by the Director-General of Health Services, New Delhi, was continued with suitable modifications to meet local requirements. The Scheme of special lectures by visiting professors and experts from various institutions was continued. The visits to important Community Development areas and hospitals for clinical demonstration were arranged. Special emphasis was laid on the preventive aspect of diseases, health promotion and health education and on practical work in the field. Besides the regular visits to Block areas and hospitals, the trainees were taken to the Tuberculosis Sanatorium at Tambaram and Leprosy Settlement at Thirumani. The doctors were taken to the World Health Organization Chemotherapy centre in Madras to study the work of the World Health Organization Team, viz., control of tuberculosis by chemotherapy under domiciliary conditions. Occasionally, special lectures at higher standards were held exclusively for doctors.

The trainees maintained weekly progress registers showing the daily activities for each week. Each trainee maintained a practical note book in which the practical sanitary engineering works were recorded. These records were scrutinised every week by the teaching staff.

A written examination was held at the end of each course and a certificate issued to each trainee.

The programme for the year was drawn up in advance and communicated to all the participating States. This programme was kept up without deviation.

The total amount spent under operational expenditure during 1960 was Rs. 73,893.50 nP.

A good library was provided for the trainees. Emphasis was laid on the importance of recreation and a course of special lectures on Community Recreation by the Director of Y.M.C.A., College of Physical Education, was arranged.

The trainees realised that the preventive side of medicine and health education could bring about a real change in the working of the Primary Health Centres. Although there were numerous problems that had to be faced by them in their day-to-day work, this training helped them to see things in a new light and gave them ideas for improving the health services in the rural areas.

The teaching staff of the Centre gave special lectures and demonstration to (i) the medical undergraduates of the Madras Medical College, Stanley Medical College in Madras City and Christian Medical College, Vellore, (ii) the medical internees from Health Unit, Poonamallee, (iii) the Engineering Graduates undergoing Public Health Engineering course and short-term courses, (iv) the undergraduates of the Government College of Integrated Medicines and (v) personnel of Community Development Department from Madras State and various parts of India.

The Orientation Training Centre was visited by prominent officials and non-officials from India and abroad.

The year under report is the seventh year of this training scheme. The importance of this training programme has been recognised by the Government of India and Government of Madras and all participating States. The Government of India have agreed to meet half the operational expenditure of this centre and the entire expenditure on stipends.

PORT AND MARINE HYGIENE.

The number of vessels, foreign and coastal, which arrived in and departed from the minor ports of this State, the number of vessels inspected in respect of cargo, crew and passengers, number of inoculations and vaccinations done, are shown in Annexure L.

CHAPTER IV—FOOD AND NUTRITION.

RAINFALL AND PRICES OF FOODSTUFFS.

The average monthly district rainfall in the different monsoons in 1960 as compared with that of 1959 and the normal rainfall is given below :—

Monsoon period.	Average Monthly District Rainfall in Millimetres.		
	1959.	1960.	Normal.
(1)	(2)	(3)	(4)
Inter-monsoon (January to May)	34.5	33.8	37.2
South-west monsoon (June to September).	85.8	87.3	93.2
North-east monsoon (October to December).	152.4	200.6	168.1
Total for the year ..	272.7	321.7	298.5

The rainfall was above normal owing to copious rainfall in November. In all the districts except Salem, Coimbatore, Tiruchirappalli and Kanyakumari districts, the rainfall was in excess of the normal.

The production of foodgrains increased by 7.4 per cent when compared to that of the previous fasli year, owing to favourable seasonal conditions and intensive cultivation scheme. The food position was therefore satisfactory. However, the prices of principal foodgrains has slightly increased as shown below :—

Year.	Prices of principal foodgrains in Rupees per Quintal of 100 k. gms.			
	Rice (II Sort).	Cholam.	Cumbu.	Ragi.
(1)	(2)	(3)	(4)	(5)
1959	61.4	40.6	40.2	37.7
1960	62.7	41.5	41.7	40.1

Agricultural labourers were generally well employed except in parts of North Arcot district where famine relief works had to be started to provide employment for them.

NUTRITION.

DIET SURVEYS.

Diet surveys were conducted as usual by weighment of raw foodstuffs consumed in each selected family for seven consecutive days. The study of diet patterns among different occupational groups in different regions was continued as far as possible. The foodstuffs consumed were also analysed on the basis of average income per family. Nine surveys among 275 families were conducted in Chingleput and North Arcot districts during 1960.

The numbers of families surveyed as per occupation, income and regions are shown below :—

Area.	Occupation.	Average Income.			
		Below Rs. 50.	Rs. 50. and less than Rs. 100.	Rs. 100 and above.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
Urban	Weavers	10	41	10	61
"	Skilled workers	..	..	30	30
"	Miscellaneous	8	59	24	91
	Total ..	18	100	64	182
Rural	Agriculturists	12	43	3	61
"	" (Hill Tribes)	29	3	..	32
	Total ..	41	49	3	93
	Grand total ..	59	149	67	275

A special survey was conducted among the hill tribes in Javadhi Hill in North Arcot district to study the diet pattern among them who were most agricultural labourers.

The places where diet surveys were conducted, the periods of survey, the composition of families, average consumption unit per family per day, occupation and income are given in Annexure M. It will be seen therefrom that in rural areas most of the families belonged to the two lower income groups, while in urban areas most of them came under the higher income groups.

As the surveys were conducted to study the diet patterns in different occupational groups, the surveys among families pursuing the same profession were combined for analytical study. The families with different incomes were however classified separately.

The average daily consumption of foodstuffs in ounces per consumption unit is given in Annexure N (1). A study of the annexure reveals the following salient features :—

(i) The consumption of cereals was generally adequate and in some groups more than the quantity recommended for a balanced diet.

(ii) The bulk of the cereals consumed was rice (mostly parboiled) among all except the hill tribes in Javadhi Hills who consumed practically millets only, due perhaps to their cultivation of millets only on the hill areas.

(iii) The intake of pulses, vegetables, milk and milk products, meat, fish and eggs and fruits was very inadequate in all classes and income groups. The consumption of leafy vegetables was practically negligible. It may however be noted that the consumption of milk and milk products was comparatively more in the highest income groups in all classes. The hill tribes did not practically consume protective foods—milk and milk products, meat, fish, eggs and fruits.

The average daily intake of nutrients of foodstuffs per consumption unit is shown in Annexure N (2) which reveals the following observations :—

(i) The quantity of protein consumed is inadequate in all classes and groups. It was comparatively better among the skilled workers and the hill tribes with an income of Rs. 50-100. The proportion of intake of animal protein is very low except in the three groups (miscellaneous workers, skilled workers, agriculturists with an income of Rs. 100 and more).

(ii) The consumption of calcium was inadequate among all classes and income groups except the hill tribes. The satisfactory intake of calcium by the hill tribes was due to greater consumption of ragi.

(iii) The intake of phosphorous and iron was satisfactory.

(iv) The quantity of Vitamin A, Riboflavin and Vitamin C consumed was inadequate in almost all classes and income groups and was grossly inadequate in the case of the hill tribes.

(v) The consumption of nicotinic acid was generally either about or a little less than the requirements. The hill tribes however consumed very low quantity of this vitamin.

The calorie value of foodstuffs consumed per consumption unit has also been estimated and given in Annexure N (2). The calorie value of foods consumed by the skilled workers only was above 2,400 calories, while that of all others was much less than this optimum level.

Besides the diet surveys among families, five surveys in institutions (three in urban areas and two in rural areas) were undertaken. The names of institutions, their location, total consumption units and periods of survey are given in Annexure O (1). The Deenabandhu Ashram Hostel, Walajapet, received a subsidy from the Government. The institutions of Daya Sadan Care Home and the Corporation Special Home in Madras and the Government Care Camp at Avadi serve mostly adults, while Ozukkanilayam Orphanage at Ramapuram (Chingleput district) had only children below 13 years.

The daily average consumption of foodstuffs in ounces per consumption unit is given in Annexure O (1). It will be seen from it that the quantity of cereals consumed was much more than 14 ozs. in three institutions, that it was a little less than the requirements in one and that it was very low in the fifth. It is however noted that besides rice, wheat and ragi were also consumed in fair proportion. The intake of all other foodstuffs was generally very inadequate and the consumption of leafy vegetables, fruits, meat, fish and eggs was practically negligible.

The nutrient values of foodstuffs consumed in the institutions are analysed in Annexure O (2). The intake of protein was not adequate in all the institutions. The consumption of calcium was inadequate in all the institutions, while that of phosphorous and iron was adequate in only three institutions. The quantity of Vitamin A, Riboflavin and Vitamin C was very inadequate. The intake of Vitamin B1 was satisfactory, while that of nicotinic acid was adequate in three out of five institutions.

The calorie value of foodstuffs was well above, 2,400 calories in Government Care Camp at Avadi, but it was a little less in two institutions and was far below than the requirements in the other two.

In general, the pattern of diet does not materially differ from one occupation to another or from one income group to another. The families in the highest income groups however consumed a little more of milk comparatively, although by itself it was quite inadequate.

NUTRITION SURVEY.

The children in the areas where diet surveys were conducted, were examined to detect nutritional deficiency in the food consumed by them. One thousand one hundred and seventy children (822 boys and 348 girls) were examined in 1960 and their nutritional status was recorded. The defects noted are summarised in Annexure P. Gross deficiency in the quantity of adipose tissue, dryness and pigmentation of the eyes and loss of lustre in the skin were noticed.

NUTRITION LABORATORY.

Studies on the loss of nutrients due to different methods of cooking the green leafy Vegetables—Ceylon Pasalai, Amaranth and Agathi were undertaken. For this study, the greens were cooked (a) with excess of water in open vessel, (b) with the required minimum quantity of water in closed vessel and (c) under steam. The results obtained indicate that the loss of nutrients is comparatively high in the case of cooking the greens with excess water in open vessel.

Study of the institutional diets was continued both for estimating losses in cooking under different methods and also for correcting gross defects in the dietary schedules. The diets provided in eleven institutions in Madras City were studied. Appropriate measures for improving the diets were suggested to these institutions for adoption.

Different raw and processed food stuffs were analysed for assessing their nutritive values. Altogether 34 samples of foodstuffs including three samples of greens, six of vegetables, nine of fruits and four of pickles were studied. Groundnuts and three varieties of bengal gram, cow gram and green gram as roasted and salted were also analysed to determine their nutritive values. The results are given in annexure Q.

Analysis of 16 samples of marine fishes of the east coast to determine their nutritive values was carried out by the Fisheries Technological Station, Tuticorin. The results of the analysis, as furnished by the Fisheries Department are given in annexure R.

NUTRITION RELIEF MEASURES.

Distribution of Skim Milk.—Skim milk powder serves eminently as a food supplement to the vulnerable group of malnourished mothers and infants, as a source of animal protein for maintenance and promotion of growth and development. The quantity of one and a half ounce or 42 grams contains 16 grams of protein of superior quality with all amino acids, and thus supplies as much as 20 per cent of the daily recommended requirement of protein besides the important mineral, calcium. The distribution of skim milk to malnourished children and mothers under the UNICEF milk feeding programme was continued during the year. About 50,000 mothers and infants were benefited by the scheme. The UNICEF released

about 9.3 lakhs lb of skim milk powder during 1960-61. The milk powder was distributed to the maternity and child welfare centres in the districts and to other special agencies as follows :—

Serial number, Districts/Agency.	Quantity in lb.
1 Chingleput	34,698
2 South Arcot	81,720
3 Tiruchirappalli	50,920
4 Thanjavur	86,520
5 Madurai	118,120
6 Ramanathapuram	143,720
7 Tirunelveli	65,600
8 North Arcot	83,140
9 Salem	126,520
10 The Nilgiris	10,000
11 Coimbatore	72,520
12 Kanyakumari	30,120
13 Corporation of Madras	17,000
14 City Hospitals	7,730
15 Perambur Railway Hospitals	940
16 Direct supplies to private institutions in Madras City.	7,590
Total ..	936,858

The milk distribution was arranged through 1,609 maternal and child health centres and hospitals as per details given hereunder :

	Number.
Municipal Centres	211
Voluntary Agency Centres	34
District Board Centres	344
Second Five Year Plan Centres	393
Backward Area Centres	95
Primary Health Centres	448
Madras City Centres (Including Corporation of Madras maternal and child health Centres and City Hospital having Paediatric Centres, etc.).	76
Poonamallee Health Unit	8
Total ..	1,609

The Director of Public Health continued to be the State Liaison Officer in respect of this programme. The progress of this milk feeding programme was reviewed at the two meetings of the State Co-ordinating Committee and necessary improvements made in accordance with the recommendations of the Committee.

School lunch programme.—The school lunch programme sponsored by the Education Department with people's contribution and financial assistance from the Government was spread over 24,000 elementary schools during the year under report, as against about 21,000 reported at the beginning of 1960

with the corresponding increase in the number of beneficiaries from 7.5 lakhs to about 8.5 lakhs. Government gave a grant of 6 nP. per meal per day, while the remaining cost was met from people's contribution. As on June, 1960, the number of children in 23,455 schools fed was 794,372.

The Harijan Welfare Department continued its own scheme of provision of free mid-day meals to the children of eligible communities attending 870 schools under its control at the end of 1960. The cost per meal worked out to 15 nP. and the entire expenditure on this scheme was met from the State funds. Sixty five thousand one hundred and ninety-two children were benefited under this scheme at the end of June, 1960.

In Madras City, 28,700 poor and malnourished children attending 278 elementary schools under Madras Corporation were given free midday meals, the entire cost being met by the Corporation. Besides this, the school lunch programme was in operation in 508 primary schools in Kanyakumari district. Five hundred and thirty-one secondary schools in this State were also providing free midday meals to 16,700 students on a voluntary basis with people's contribution.

The Nutrition Bureau of this Department worked out a standard diet conforming to the minimum standards of nutrition for adoption in the Harijan Welfare Hostels and subsidised hostels. The above standard diet schedule was ordered to be communicated to all Harijan Hostels for guidance. A copy of this diet schedule is given in annexure S.

Towards enriching the nutritive value of the midday meals provided to the school children, a scheme for the inclusion of multi-purpose food in the meals is under consideration of the Government. Arrangements were made during the year for the starting of two plants at Coimbatore and Madurai to produce multi-purpose food required.

A proposal for the free distribution of seeds of green leafy vegetables to the schools for the purpose of rearing kitchen gardens, so that the produce may be utilised with advantage in the school lunch programme was also being examined.

Distribution of food Supplements.—The Central Nutrition Bureau of this Department distributed multi-vitamin tablets and other food supplements to the needy children in selected institutions based on the results of the nutrition surveys undertaken. During the year 50 lbs of shark liver oil, 6,900 calcium lactate tablets, 4,300 Fersolate tablets, 2,400 yeast tablets, 3,900 vitamin 'B' complex tablets and 1,000 multi-vitamin tablets were distributed.

In Madras City, the Corporation of Madras administered ill nourished school children with shark liver oil and calcium lactate and children suffering from stomatitis of nutritional origin with yeast.

Food supplements gifted by the UNICEF were distributed through maternal and child health centres to the needy children and mothers towards correcting specific deficiency signs.

Feeding trials with Nutro Biscuits and Multi-Purpose Food.—At the instance of the Director-General of Health Services, feeding trials with Nutro biscuits prepared by the Britannia Biscuit & Co., Ltd., Calcutta and multi-purpose food by the Central Food Technological Research Institute, Mysore, were undertaken in selected maternal and child health centres and schools in and around Poonamallee Health Unit. The Meals

for Millions Association of India, New Delhi arranged for the supply of 26 lb. of Nutro biscuits and 1,000 lb. of Multi-Purpose food for this purpose. The feeding trial with Nutro biscuits was commenced on 19th November 1960 in the Maternity Homes of the Health Unit at Poonamallee. The trial covered a total of 32 children who were given eight biscuits twice a week. The trial with Multi-Purpose food will be commenced in 1961. These feeding trials will be carried out for a period of three months. The children included in the trials were subjected to initial nutritional assessment. The final assessment will be made at the close of the trial.

Well Baby Clinic in Poonamallee Health Unit.—The Nutrition Officer was deputed to the Health Unit area to study the food habits and the diets given to the children and advised the mothers to follow right food habits. They were also educated on the diet requirements of the children so as to keep them healthy. Food supplements, viz., Vitamin A and D capsules, yeast, Calcium, Iron and Vitamin 'B' Complex tablets were also distributed. The children showed improvement in their health and nutritional conditions. The scheme has become popular.

NUTRITION EDUCATION AND PUBLICITY.

A course of training in scientific nutrition for subordinate health personnel was held during February-March, 1960. Seventeen candidates (ten Health Inspectors, six Sanitary Inspectors and one Health Visitor) underwent this training course successfully.

The "More Milk Day" was celebrated this year as usual on the Tamil New Year's Day on 13th April, 1960. The health staff in the districts actively participated in this celebration. Free distribution of milk to the children was specially arranged through the maternal and child health centres. In certain areas, classes for mothers were arranged by the maternal and child health staff to educate them on the importance of milk consumption. Processions comprising school children and interested persons were also taken out on that day. In the public meetings organised in connection with this celebration, the health staff participated and delivered lectures explaining the significance of this celebration and educating the public on the need for increased production and consumption of milk.

Education of people in nutrition by means of exhibitions, film shows, radio talks, lectures, etc., was continued as usual. During the year, six nutrition exhibitions were organized, two in Madras City and the remaining four in the districts.

The films on food and nutrition were exhibited during Nutrition and Health exhibitions. These films were also lent to the local bodies for exhibition as part of health education programme. The All-India Radio, Madras and Tiruchirappalli, broadcast several talks on different aspects relating to food and nutrition.

The Madras State Branch of the All-India Women's Welfare Food Council carried out education on the nutritive values of unaccustomed and alternative foodstuffs. For this nutrition education work, a monthly grant of Rs. 322.50 nP. was paid to this institution by Government.

The Brochure on "Low cost Balanced diet and School Lunch Programmes" prepared by the Nutrition Research Laboratories, Indian Council of Medical Research, was printed in Tamil and the copies were

distributed to the health staff in the districts and Block Development areas to serve as an aid and guide in the nutrition education work. Towards encouraging the use of wheat, a pamphlet on "Wheat Recipes" was issued by the Information and Publicity Department. Copies of this pamphlet were widely distributed.

OTHER ACTIVITIES.

The Ninth Conference on Nutrition reviewed the progress of nutrition work during the year 1959 and recommended plans for further measures.

FOOD ADULTERATION.

The Government Analyst, King Institute, Guindy, continued to analyse food samples from local bodies, etc., under the Prevention of Food Adulteration Act, 1954. Food samples were received from 159 local bodies comprising 63 Municipalities and 96 Panchayats excluding the Corporation of Madras which has its own Public Analyst to analyse food samples taken in Madras City.

The total number of samples received during the year was 10,895 of which only 2,715 samples were reported upon. Many more samples were analysed but no report could be sent to the local bodies concerned owing to the inadequacy of clerical staff. The question of appointment of extra typists is under the consideration of Government. The percentage of samples found adulterated was 26.0 as against 24.5 in 1959.

The following table gives the details of the nature of samples received, number analysed and the number declared adulterated :—

Nature of samples.	Total number of samples received.		Number of samples reported.		Number adulterated.		Percentage adulterated.	
	Government Analyst.	Public Analyst under of Corporation Madras.	Government Analyst.	Public Analyst under of Corporation Madras.	Government Analyst.	Public Analyst under of Corporation Madras.	Government Analyst.	Public Analyst under of Corporation Madras.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1 Milk ..	5,232	4,642	1,364	4,642	612	2,005	44.9	43.2
2 Gingelly oil ..	1,716	1,143	429	1,143	28	99	6.5	8.7
3 Coconut oil ..	754	385	183	385	2	10	1.1	2.6
4 Coffee powder	951	286	235	286	7	22	3.0	7.7
5 Flour ..	473	..	50	..	2	..	4.0	..
6 Ghee ..	309	892	75	892	14	77	18.7	8.6
7 Turmeric ..	334	57	78	57	6	21	7.7	36.8
8 Tea ..	219	102	53	102	7	6	13.2	5.9
9 Groundnut oil	260	143	65	143	2	24	3.1	16.8
10 Butter ..	163	583	43	583	17	96	39.5	16.5
11 Dhall ..	133	92	45	92	5	35	11.1	38.0
12 Honey ..	50	5	12	5	1	..	8.3	..
13 Sweets ..	16	..	5	..	..	..	..	..
14 Miscellaneous	285	47	73	47	3	11	4.1	23.4
Total ..	10,895	8,377	2,715	8,377	706	2,406	26.0	30.0

Addition of coal-tar colours to tea and dhall was detected. In some cases the use of saccharin in aerated waters was not notified in the label on the containers.

A number of cases under the Act have ended in acquittal due to improper prosecution evidence and non-observance of the provisions of section 10 (7) of the Act. Strict instructions to the Food Inspectors were issued to comply with the relevant provisions of the Act carefully in future. The average fine imposed on offenders was fairly heavy.

The Government Analyst continued also to analyse samples received from the following sources: (i) Diet articles from Government Hospitals; (ii) Drugs under the Drugs Act received from the Drug Inspectors and from the Government Hospitals; (iii) Foods and drugs from other Government Departments, Jails, Magistrates and Police and also the public. The details of food and drug samples and the miscellaneous samples of various categories analysed in 1960 are given below:—

Source.	Number of samples received.	Number of samples received.	Number adulterated or otherwise unsatisfactory.
(1)	(2)	(3)	(4)
1 Food samples under the Prevention of Food Adulteration Act, 1954	10,895	2,715	706
2 Diet articles from Government Hospitals.	8,251	6,843	589
3 Drug samples under the Drugs Act ..	196	115	19
4 Drugs from Government Hospitals and other institutions.	187	174	114
5 Vanaspathi from the Director of Industries and Commerce.	9	7	Nil,
6 Miscellaneous articles from—			
(a) Magistrates	17	17	12
(b) Jails	17	15	6
(c) Police	16	16	10
(d) Other Government departments ..	113	85	21
(e) Government of India departments.	46	39	21
(f) Unofficial source	20	17	

FOOD POISONING CASES.

As a result of recent case of food poisoning in Karaikal where maida flour became suspect, about 100 maida samples were obtained from all over the Madras State and examined by the Government Analyst for any possible contamination with parathion. All the samples were however free from any contamination.

HOTEL SANITATION.

The Health Officers visited 4,402 out of 7,108 licensed hotels in 1960 to see whether the recommendations of the Hotel Sanitation Committee regarding upkeep and maintenance on hygienic principles were being implemented. Four hundred owners were prosecuted for various defects noticed, failure to provide sterilising sets, fly and dust proof covers, use of improperly tinned vessels, etc. In accordance with the Catering Establishment Rules, 1959, the Medical or Health Officers examined the employees at the time of appointment and subsequently also once a year to see that persons with any infectious disease is not employed.

FOOD CONTROL.

The activities of the Veterinary Department regarding public health during 1960 are summarised below:—

The Veterinary staff examined the general health of the milch animals belonging to jails, co-operative milk supply societies and unions and of those milked at hospitals. The milking yards in Government hospitals were also visited and necessary advice given for keeping the yards, milking utensils in proper hygienic condition.

The local bodies which have public slaughter-houses without Veterinary Assistant Surgeons availed themselves of the services of those in the Veterinary Department. The latter conducted meat inspection in 72 slaughter houses of the local bodies. During the year, 28,839 cattle, 889,078 sheep, 446,819 goats, 5,359 pigs and 16,146 buffaloes were examined ante-mortem to see their fitness for being slaughtered. Of these, 26,426 cattle, 881,070 sheep, 431,982 goats, 5,311 pigs and 16,119 buffaloes were declared fit for human consumption. After the slaughter the carcasses were again examined before stamping as fit for sale and those found unfit were condemned.

CHAPTER V—ENVIRONMENTAL HYGIENE.

RURAL WATER-SUPPLY.

The Rural Water-supply (Comprehensive) Scheme is intended to Provide drinking water in rural areas with a population of not more than 10,000 by providing (i) bore-wells with pumps attached, (ii) closed wells with overhead tanks and taps, (iii) connections from water mains of Municipalities and (iv) draw-wells. A contribution of 25 per cent of the expenditure is generally collected from the beneficiaries. In the case of works exclusively benefitting the Harijans, poor and backward sections of people, no contribution is insisted upon. (A sum of Rs. 194.56 lakhs has been provided as plan outlay for this scheme under the Second Five-Year Plan. A sum of Rs. 55.70 lakhs was expended under this scheme and 2,982 wells and 45 composite schemes were put up in 1960)

The National Water-supply and Sanitation (Rural) Scheme is sponsored by the Government of India for the eradication of water-borne, diseases, such as, cholera, typhoid, dysentery, etc., in villages with a population of not more than 5,000. The scheme envisages provision of adequate water-supply by means of bore-wells or pipes with overhead tanks and taps and repairs to old wells and the provision of sanitation facilities by constructing bore-hole latrines in individual houses and community latrines for the common use of the villages. A contribution of 5 per cent of the expenditure is also collected from the beneficiaries. It is waived in the case of works meant exclusively for the Harijans, poor and backward classes. Under this scheme, a sum of Rs. 121.54 lakhs has been provided as plan outlay under the Second Five-Year Plan. The expenditure incurred on this scheme in 1960 is Rs. 28.19 lakhs. The number of villages provided with water-supply and with sanitation facilities was 150 and 122 respectively.

URBAN WATER-SUPPLY AND DRAINAGE SCHEMES.

The Sanitary Engineer continued to deal with the investigation, design and maintenance of water-supply and drainage schemes of local bodies (other than the Corporation of Madras). The Executive Engineer (Public Health) Investigation and Maintenance Division with his headquarters at Madras

assisted by three Assistant Engineers (Public Health) Investigation with headquarters at Salem, Tiruchirappalli and Chingleput attended to the investigation of water-supply and drainage schemes. The Executive Engineer (Public Health) Investigation and Maintenance Division carried out periodical inspections of water-supply and drainage schemes maintained by the local bodies. A new Public Health Division with headquarters at Madras was formed on 25th July 1960 with two investigation sub-divisions with headquarters at Chidambaram and Chingleput for investigating the augmentation of Madras City. Water-supply Scheme from Cauvery river as a source. The Sanitary Engineer continued to give technical advice to the Board of Revenue on matters pertaining to Rural Water-supply Schemes and National Water-supply and Sanitation (Rural) Schemes. The Government Experimental Filter Station at Kilpauk continued to be under the control of the Sanitary Engineer.

[Twenty-six water-supply schemes and seven drainage schemes were under various stages of investigation during the year 1960. Twenty-seven water-supply and drainage schemes were in different stages of design. Detailed plans and estimates for 21 schemes at a total cost of Rs. 168.31 lakhs were submitted to the Chief Engineer, Public Works Department (General), for technical sanction.]

The Sanitary Engineer accorded technical sanction to 63 estimates aggregating to Rs. 18.48 lakhs for miscellaneous works.

The water-supply and drainage pumping installations were maintained by the Mechanical Expert of Sanitary Engineer's Office. Wherever necessary, the concerned local bodies were given suitable advice for the proper upkeep of the machinery. Similarly, suitable advice was continued to be given to local bodies to secure chemically and bacteriologically safe drinking-water supply to the public based on the water analysis report.

The Sanitary Engineer in his capacity as the Inspecting Officer for the water-supply and drainage works continued to deal with references relating to designs, estimates, grant statements, loan applications, etc., pertaining to such works. Proposals in respect of water-supply and drainage schemes receiving financial aid from the Union Government under the Second Five-Year Plan was also examined and suitable recommendations made to higher authorities.

RURAL AND URBAN SANITATION.

Effective steps were taken by this Department for the provision of suitable public and private sanitary conveniences by persuasion, education and prosecution under the provisions of the Madras Public Health Act, 1939, where necessary.

The progress under the Environmental Hygiene Scheme included in the Second Five-Year Plan with the object of providing improved and sanitary type of latrines in rural areas was continued satisfactorily. According to the plan, it was proposed to construct 2,300 latrines during the year 1960-61 at an estimated cost of Rs. 44,300 to be equally borne by the District Boards concerned and the Government.

Consequent on the resolution at the Health Officers' Conference held in August, 1959 a committee with selected officers of this Department is proposed to be constituted to prepare a comprehensive scheme for popularising the use of latrines. The Committee will undertake tour in all the districts and submit its report within a year.

WATER ANALYSIS.

Protected water supplies to 48 municipalities, 18 panchayat boards, 13 jails and approved schools, 24 railway stations and three other institutions were examined by the Water Analysis Department thrice a year for hygienic quality. Each of the eight hospitals in the City was visited three to four times a month and tests were conducted on the spot for residual chlorine. Once a month samples were also collected for bacteriological examination. At the request of the Civil Aerodromes, Madras, Messrs. Binny and Co., and Caltex (India) Limited, the drinking water supplies to these were periodically analysed. The hygienic quality of the swimming pool water in the Gymkhana Club was checked once a month at the request of the club authorities. Several companies, Industries, etc., got their water samples examined regarding their fitness for drinking and industrial purposes.

During the year 10,800 water samples from the protected water-supply systems, rural water-supply schemes and other miscellaneous investigation sources were examined for their physical, chemical, bacteriological and biological characteristics. In addition 73 samples of sewage and industrial effluents, five samples of bone and urine for fluorine content, three samples of boiler and cooling system scales, 25 samples of chemicals used in water treatment and five samples of air were also examined. One hundred and sixty-three samples of milk can washings from the Government Milk Factory, Madras, were examined bacteriologically to assess to the pasteurisation and storage efficiency. Fifteen samples of disinfectants were tested for their phenol co-efficient value. Forty-six agar cultures of Standard B. Typhosus 786 Hister Strains were supplied to the various laboratories in India for the use in Rideal Walker test. One hundred and fifty-nine samples of faeces and sludge from bore-hole latrines in the Research-cum-Action Project area, Poonamallee, were examined for intestinal parasites. Of these, 20 samples of bore-hole sludge were tested chemically for fertiliser value. One hundred and thirty samples of condiments, cereals, vegetables and flour were examined for their fluorine content in connection with the researches on fluorine in food materials.

Out of 1,052 samples of water examined under the rural water-supply schemes, 154 had to be declared as unfit for human consumption because of excessive fluorine, dissolved solids, iron and manganese contents. The results of analysis of some of the water samples from wells showed heavy organic pollution due to the location of drains close to the sources. Many open wells are used as source for public water supplies under the rural water-supply schemes. They need to be very carefully protected against contamination to ensure a constant safe supply. In the final reports the sanitary safeguards required for protecting wells were suggested wherever necessary. It is also of the utmost importance that the wells should be located in sites which will avoid undesirable pollution.

Field investigations on problems of iron in water-supply schemes, corrosion and water quality, changes in salinity of water, deterioration in bacterial quality in the water supplies, in industrial waste treatment and disposal, control of aquatic growths in water supplies and air pollution, were carried out by the Water Analysis Department. The Department is examining the water quality and treatment measures in connection with the proposed Raw Film Factory at Ootacamund.

Typical cholera like Vibrios conforming to morphological, bio-chemical and serological characteristics were isolated from water samples collected from

a water-cart in a municipality. The municipality was telegraphically alerted. No incidence of cholera was however reported.

Faecalis alkaligence bacterial organisms were isolated repeatedly from a well water. The water also showed a high organic pollution and diarrhoea cases were reported among the consumers.

The following researches were carried out by the Department of Water Analysis :—

- (i) Pilot plant trials to remove fluorine from water at Guntakal.
- (ii) Studies on the treatment and disposal of tannery effluents.
- (iii) Experiments on water purification of the Red Hills lake water using break point method of chlorination prior to slow sand filtration.
- (iv) Studies on the fluorine content of various food materials under a scheme sponsored by the Indian Council of Medical Research.
- (v) Studies to ascertain whether the bore-hole latrines put up at Poonamallee by the Research-cum-Action Project could be economically re-used and sludge taken out of them would be of any fertiliser value and if so, safe for handling.
- (vi) Evaluation of cesine methylene blue agar and Mackonkay's agar in the coliform test for water.
- (vii) The E-coli density in untreated infiltration gallery waters.
- (viii) Studies to find out the nature of the intestinal coliform flora in animals.

Facilities were provided for Public Health Engineering students to carry out practical exercises and research in laboratories under the guidance of the Chief Water Analyst, King Institute, Guindy.

WATER AND SEWAGE PURIFICATION COMMITTEE.

The Director of Public Health continued to be the President of the Water and Sewage Purification Committee. The Committee met in February, 1960 and discussed and recommended to Government that the frequency of examination of samples of public drinking water should be increased and laboratories at water works provided to enable day-to-day tests to regulate the treatment processes and as a check on the success of the methods used. This is under consideration of Government.

COMPOST MANUFACTURE.

The scheme is intended to provide a cheap-organic manure to the ryots for increasing the crop yields by utilising the available urban wastes and nightsoil, etc., and for production of good quality compost on scientific and hygienic lines.

The scheme is run by 66 municipalities and 267 notified panchayats besides three Township Committees and Corporation of Madras. A loan of Rs. 4,19,550 was sanctioned during the year to the local bodies for improvement of compost work and an amount of Rs. 101,200 was also sanctioned to the local bodies as subsidy to cover the loss on account of the sale of compost at the rate of Rs. 2 per ton. A total quantity of 372,631 tons was produced and a quantity of 339,592 tons of compost was distributed to the ryots. A probable area of 67,918 acres of land would be benefitted by the application of compost resulting in additional production of foodgrains.

A number of Sanitary Inspectors, Executive Officers, Health Assistants, Sanitary Maistries, etc., from municipalities and panchayats were trained in compost manufacturing on hygienic lines to enable the local bodies to manufacture compost on right hygienic lines.

BUILDINGS.

The enforcement of the provisions of Chapter IX and X of the Madras District Municipalities Act relating to maintenance of streets and building regulations was satisfactory in all the municipalities. There was also improvement in the enforcement of these provisions in 85 panchayat areas where they were in force.

There were in all 81 sanctioned town-planning schemes in the local areas. These were at various stages of execution and much progress was made in their execution.

THE MADRAS CITY IMPROVEMENT TRUST.

The Director of Public Health continued to be the ex-officio trustee of the Madras City Improvement Trust during the year and took part in its deliberations.

FAIRS AND FESTIVALS.

About 500 fairs and festivals (200 major and 300 minor) were held in the State. As usual, adequate sanitary arrangements were made during all the fairs and festivals. Special measures were taken in respect of bigger festivals like Samayapuram Mariamman festival, Arokiamatha festival at Velanganni, Karthigai Deepam Festival at Tiruvannamalai, Vaikunda Ekadasi festival at Srirangam, Arudra Darisanam at Chidambaram, Chitrai festival at Alagarcoil, Madurai, which attracted a large number of pilgrims. All the festivals passed off without any out-break of epidemics either during or in the wake of festivals.

RESEARCH-cum-ACTION PROJECT, POONAMALLEE.

The Research-cum-Action Project continued to function. In order to test the principles formulated by the study in the Poonamallee area in the districts of Madurai and Thanjavur, sanction was accorded to extend the project till September, 1961.

HEALTH EDUCATION.

Intensive health education by the new approach method evolved in 1959 was continued in 18 villages and in 13 additional villages distributed over the four Blocks. As per the new approach, only such villages which wanted the programme and which had generally higher literacy, better water facility, better economic conditions, more co-operative leaders and had shown better response to other development programmes initiated by the Block, were selected. Training sessions and camps were arranged for field workers, Block Development Officers, Medical Officers, school teachers, village leaders and women including gramasevaks, Maternity Assistants, Health Visitors, Social Education Officers (Women) and the personnel of Welfare Extension

An attempt was made to study the attitudes of the field workers to these principles evolved by the project. Every field worker who participated in the sanitation programme in the four Blocks was asked four questions in respect of each of the 50 principles evolved. Analysis of the answers showed that the workers found working with 32 out of the 50 principles was either moderately or highly successful. Discussions were had with field workers on the principles which worked less successfully in each Block.

The Project arrived at an index on receptivity to latrines by asking a sample of villagers about their personal interest in latrines. This study has since been used to identify villages and villagers receptive to latrine programme. It was proposed to test the guide lines developed by the Project in Thanjavur and Madurai districts. The Project staff visited Thanjavur (i) to get up a questionnaire for the base line study of the villages where latrines installed under National Water-supply and Sanitation Scheme are not in use and (ii) to give a general idea to all other agencies concerned, such as Block Development Department, Primary Health Centre, Education and Welfare Departments, about the object of the extension of the Research-cum-Action Project in the Four Community Development Blocks of Thanjavur district.

The various studies on Village Leaders Camps, Rural Health Committees, Villagers' attitude to Research-cum-Action type latrines, attitude of the villagers to night soil manure, etc., were completed. Apart from this, the study of the observations made in field work helped a continuous re-adjustment of the work of the team in the villages.

Public Health Engineering.—A new type of latrine was evolved and introduced in the 13 villages taken up for intensive work. The basic element, namely, water seal pan connected to a leach pit remained the same. The points of difference consisted in the use of the better finished pan developed at Poonamallee, the 'Y' pipe with the cleaning eye to facilitate the connection of the lead pipe to the alternate pit and in the standardising of the leach pit 2 feet 3 inches square or round and 6 feet deep. The sale of squat plate, pan, 'Y' pipe, lead pipe and cover slab costing Rs. 23.50 nP. was subsidised, the value of the subsidy being Rs. 20. The cost of digging the pit, lining it if necessary and erecting the enclosures, was to be met by the beneficiary.

The Government sanctioned on an experimental basis the construction of three workshops at the Block Headquarters of Tiruvellore, Sriperumbudur and Kadambathur for manufacturing the latrine parts departmentally to bring down the cost of the latrine parts and ensure prompt supply of the same to villagers. Construction of the workshops has been taken up.

To facilitate manufacture of latrine parts the Public Works Department Workshop, Madras, has successfully manufactured cast-iron moulds at a reasonable cost of Rs. 205 each. Recently, concrete moulds have also been manufactured in the Research-cum-Action Workshop, Poonamallee.

The following studies on latrine construction were undertaken :—

(i) The study on construction of cheap enclosures by using stabilised soil lime mixture and plastering of mudwalls with bituminised sand, was continued. Lime wall was constructed in the Orientation Training Centre, Campus, Poonamallee and five mud walls plastered with bituminised sand were constructed at Melakandiar. The experimental walls of both types have withstood the heavy onslaught of the monsoon during November, 1960.

(ii) To determine the minimum quantity of reinforcement with which pit cover slabs could be cast, 28 slabs were initially cast and tested. Based on the study of the results of these, another set of slabs was cast and tested. The results are being evaluated.

(iii) In water scarcity areas it was felt that latrine pans provided with flap traps, instead of the usual water seal traps, could perhaps be advantageously used. Therefore, flap trap pans were manufactured and installed in Kandur village in Sriperumbudur Block and in the experimental latrines of the Orientation Training Centre Hostel. The efficacy of the metal flaps to prevent odour and fly nuisance and the durability of these metal flaps, are being observed.

(iv) The study on determination of the manurial value of digested night soil in the leach pits and the period of survival of pathogenic organisms in the pits is being continued in collaboration with the King Institute, Guindy.

CONSTRUCTION OF LATRINES FOR HARIJAN VILLAGES.

In seven Harijan Colonies, latrines were constructed on a new basis. The platforms for the latrines were fixed by the mason employed by the Block. The Harijans themselves constructed the enclosures (mud walls) and thatched roofs and were paid a sum of Rs. 15 after the construction. In many cases, Harijans spent a little extra money on their own and constructed pucca walls. The scheme worked successfully and almost all the 64 latrines constructed are under use. The construction was preceded and succeeded by education programme.

A conference of the Social Scientists and the Administrative Officers was held. It reviewed the work done by the three projects so far and discussed subjects for further study. It was suggested that their findings might be included in the syllabi of the training centres for Village Level Workers Health Inspectors, Public Health Engineers, Health Officers, etc., and that the guidelines developed might be tested in two selected districts outside Poonamallee area.

The programme Evaluation Organisation Team of the Planning Commission discussed with the Research-cum-Action Team on the nature and progress of work and on the principles followed so far visited several experimental villages, observed the use of latrines by the villagers and had discussions with the Block staff. It has expressed appreciations of the method of working the programme through Block staff.

The expenditure incurred by the Research-cum-Action Project during 1960 under recurring and non-recurring was Rs. 1,26,176.63 nP.

The work of this Project is now gaining appreciation. The design of the latrine is being continually improved. The health education principles and methods are being studied and applied on an intensive scale. The Social Scientists are making valuable on the spot studies of the behaviour change of the villagers. So far nearly 74 per cent of the 700 latrines constructed are in use.

CHAPTER VI—GENERAL ADMINISTRATION.

PUBLIC HEALTH STAFF.

The strength of the officers in the Public Health Department as on 31st December 1960 is given in Annexure U.

During the year under review, a post of Assistant Director of Public Health and a post of Health Officer have been sanctioned for the Pilot Project of Smallpox Eradication. Another post of Assistant Director of Public Health has also been sanctioned for the Health Education Bureau.

Since the Department is still short of Health Officers, Government have permitted the re-employment of certain retired officers up to 30th June 1961. The attraction for the posts of Health Officers in the Public Health Department continued to be slack.

One Assistant Director of Public Health underwent a refresher course in modern trends in Public Health Administration at the All-India Institute of Hygiene and Public Health, Calcutta. Two Health Officers were deputed abroad for higher training in the field of Health Education and Preventive and Social Medicine.

Two Assistants Directors of Public Health, one Health Officer and one Senior Entomologist retired from service and the Officer in Charge, Orientation Training Centre, was relieved, as he was appointed in the Medical College at Vellore, one Health Officer appointed under emergency provisions died.

An Accounts Officer was appointed in charge of accounts and audit branch of this office.

Subordinate Health Staff.—The strength of Health Inspectors in the Madras Public Health Subordinate Service as on 31st December 1960 is given in Annexure V. Of the existing cadre strength of Health Inspectors both permanent and temporary, excluding the 32 temporary posts of Epidemic Reserve, 10 per cent are selection grade posts of Health Inspectors. In addition, to this, the cadre strength of Health Inspectors has been temporarily increased by 47 posts of Selection Grade Health Inspectors appointed as eight Unit Officers, National Malaria Eradication Programme, 10 Team Leaders of B.C.G. Campaign, 29 Health Inspectors for the Health Education Bureau and Smallpox Eradication Programme. Ten posts of Personal Assistants to District Health Officers in all districts except the districts of the Nilgiris and Kanyakumari have also been sanctioned. In addition, one out of the three posts in the Research-cum-Action Project, Poonamallee has been upgraded into that of a Personal Assistant to District Health Officer with effect from 1st March 1960. Seven Health Inspectors were deputed to other Departments of this Government, other States in India and foreign Governments. Eight Health Inspectors retired from service, one died and five were punished.

Health staff under Local Bodies.—The strength of public health staff employed under the District Boards and Municipal Councils including Township Committees and in the Corporation of Madras are furnished in Annexure W. In addition to this, a large number of sanitary workers were employed for conservancy and other works. A few posts of Medical Officers (Maternal and Child Health) were kept vacant due to dearth of qualified candidates. Some of the posts of Health Assistants (Birth and Death Registrars and Vaccinators) were filled by emergency trained candidates for want of qualified persons.

FINANCE.

The actual expenditure incurred (including adjustments of the Accountant-General, Madras) on "Public Health" during the year 1959-60 is detailed below :—

	RS.	RS.
I. Under the control of the Director of Public Health—		
(a) Staff—		
(i) Pay of Officers	4,65,447	
(ii) Pay of Establishment	17,00,944	
(iii) Dearness Allowance	14,54,765	
(iv) Travelling Allowance and other Compensatory allowances.	5,94,423	
(v) Fixed Travelling Allowance	1,53,980	
(vi) Medical charges	1,603	
(vii) Stipends to Trainees	43,314	
(viii) Honoraria	10,958	
		44,25,434
(b) Other charges		94,88,883
Total ..		1,39,14,317
II. Under the control of others—		
1 Sanitary Engineer	(—) 7,81,254	
2 Director of Town-Planning	82,885	
3 Director of Medical Services	23,84,431	
4 Board of Revenue	3,94,602	
5 Charges in England	9,441	
		20,90,108
Grants for Public Health purposes ..		31,54,375
Grand total ..		1,91,58,797

Out of the total grants of Rs. 31,54,375 incurred under the head "39. Public Health (b) grants for Public Health purposes", grants amounting to Rs. 6,92,983 relate to this Department.

Besides the expenditure of Rs. 1,39,14,317 controlled by the Director of Public Health, expenditure amounting to Rs. 1,49,456 was also incurred by this Department during the year 1959-60—(Rs. 13,024 incurred in respect of Vital Statistics Establishment and Rs. 1,36,432 incurred in respect of training of thayis).

The total receipts under Revenue Account of this State for the year 1959-60 were Rs. 8,110.65 lakhs. Total expenditure incurred under the

major heads "39. Public Health" and "38. Medical" was Rs. 1,91.59 lakhs and Rs. 4,91.54 lakhs respectively. The percentage of expenditure incurred by this Department to the total expenditure under the head "39. Public Health" was 76.2 as shown below :—

Head.	Total expenditure incurred.	Expenditure incurred by the Public Health Department.	Percentage of expenditure incurred.
(1)	(2)	(3)	(4)
	RUPEES IN LAKHS.	RUPEES IN LAKHS.	
39. Public Health	191.59	146.07	76.2

Particulars of expenditure and receipts in respect of the Corporation of Madras, Municipalities and District Boards for the year 1959-60 are furnished in the following statement :—

Statement showing the expenditure and receipts for the year 1959-60 in respect of Corporation of Madras, Municipalities and District Boards.

Subject.	Expenditure.		
	Corporation of Madras.	Municipalities.	District Boards.
	(2)	(3)	(4)
(1)	RS.	RS.	RS.
1 Medical Relief	12,64,030	14,28,861	36,09,161
2 Preventive Medicine	81,32,196	1,47,95,515	17,31,435
3 Water-Supply and drainage	75,55,565	69,73,693	..
4 Town-Planning	1,25,166	7,45,877	1,381
Total	1,70,76,957	2,39,43,946	53,41,977

Subject.	Receipts excluding Government grants and contributions.		
	Corporation of Madras.	Municipalities.	District Boards.
	(5)	(6)	(7)
	RS.	RS.	RS.
1 Medical Relief	85,184	58,228	1,54,553
2 Preventive Medicine	4,02,028	35,24,673	2,64,610
3 Water-Supply and drainage	3,52,98,378	82,11,106	..
4 Town-Planning	80,009	7,63,694	9,277
Total	3,58,65,599	1,25,57,701	4,28,440

PUBLIC HEALTH BOARD.

Two ordinary and one extra-ordinary meetings of the Public Health Board were held during 1960. The members of the Public Health Board visited Research-cum-Action Project and the Orientation Training Centre at Poonamallee. Some of the important resolutions passed at these meetings are :—

(i) It was resolved that a special committee be constituted to study the public health conditions in this State for suggesting improvements therein and for submitting proposals to amend the Madras Public Health Act for more efficient public health administration.

(ii) It was resolved that necessary directions under Section 6 (2) of the Madras Public Health Act be issued empowering the Director of Public Health to inspect, control and superintend the health measures connected with smallpox situation in the City of Madras.

(iii) It was resolved that the senior most Health Inspectors and Sanitary Inspectors be appointed as Personal Assistants to the Commissioners of Grade III Municipalities.

(iv) It was resolved that the Government be requested to issue an order to the effect that the Health Education Council serve as an Advisory Committee to the Research-cum-Action Project.

The Government have taken necessary action on some of the resolutions. A committee has been constituted to study the public health conditions and submit proposals to amend the Madras Public Health Act. The report of the Committee is under consideration of Government. The Director of Public Health has been empowered to inspect, control and superintend the measures taken to control the prevalence of smallpox in the City of Madras.

Copies of the Proceedings of two ordinary meetings and one extra-ordinary meeting of the Public Health Board held in 1960 are given in Annexure Y.

CHAPTER VII—CONCLUDING REMARKS.

There has been a slight decrease in the recorded birth rate from 28.5 per 1,000 of population in 1959 to 26.7 in 1960. The general death rate was 12.1 and the infant mortality rate was 91.6 in 1960 as against 11.9 and 91.1 respectively in 1959. The differences are negligible. During the past decade, the birth rate has remained more or less steady, round about 28.4, while the general death rate and infant mortality rate show a definite decline. The maternal mortality has decreased from 3.9 in 1959 to 3.5 in 1960. The mortality from cholera and smallpox has further decreased as compared with 1959. The number of deaths from cholera, smallpox and plague constitute only 0.4 per cent of the total deaths recorded in the State. There has also been a reduction in the deaths from malaria and respiratory diseases and a slight increase in the deaths from dysentery and diarrhoea and fevers other than malaria.

Three programmes for eradication of smallpox, malaria and guineaworm have been undertaken. During the year, a pilot scheme for smallpox eradication was put into operation in Chingleput district. A fresh organisation for this purpose was set up. Registers showing unprotected persons and children had to be first prepared for the entire area. Owing to dearth of qualified Vaccinators, candidates were recruited and given special intensive training in vaccination. About 200 candidates were trained. The pilot scheme has been successfully implemented in about five taluks up to the end of 1960. Under this scheme 783,198 vaccinations were performed by the pilot project staff and taking into consideration the vaccinations performed by the permanent vaccination staff also in the district, the population protected by the vaccination comes to about 84 per cent. The percentage of success among primary vaccinations was 97.8 and in the case of re-vaccinations 40

per cent. The high percentage of success is due to the use of fresh and potent vaccine issued daily from refrigerators, good vaccination techniques and proper supervision. It is proposed to extend the smallpox eradication programme to all other districts. In this connection, it may be stated that the Director of Public Health, Madras, has been nominated by the President of India as a member of the Central Committee on Smallpox Eradication.

The third and the final year of the attack phase of malaria eradication programme has been gone through successfully. Concurrently, the surveillance phase of the programme was also undertaken. The elaborate preliminary preparations including the recruitment and training of over 6,000 Surveillance Workers and Surveillance Inspectors, planning of their allocation of work, etc., were all carried out according to the time schedule. The implementation of surveillance was a little delayed for want of necessary sanction for appointment of Surveillance Inspectors and workers in time. However, Madras State has been the first to organise the surveillance work according to programme. The malaria work in the State has been recently reviewed by the Director, National Malaria Eradication Programme and the Union Health Minister has acclaimed that the work on malaria eradication programme in this State has been the best and is a model for the country. Various Malariologists from other States are now being deputed to this State to study the malaria eradication work. An International Conference of World Malariologists under the auspices of the World Health Organisation is scheduled to take place in September 1961 in this State.

The State-wide guineaworm programme was continued in all the endemic areas in the State. As only a few pockets in Chingleput district were infected, the survey and eradication measures were specially undertaken by the staff at headquarters. Intensive health education on the cause and prevention of the disease has been undertaken, so that the measures to eradicate the disease might be effective. It is found that the existing staff sanctioned for the programme is inadequate and about 120 Field Assistants are required additionally to carry out the treatment of water sources with chemicals periodically and systematically according to the time schedule.

The maternal and child health services in rural areas have been further extended during 1960. Out of 1,945 maternal and child health centres and homes, 1,659 are located in the rural areas. All the centres of Government have been opened in rural areas only. Even these centres are quite inadequate for the needs of the rural areas in the State. Under the Madras Panchayats Act, 1958, it is obligatory on the part of the Panchayat Unions to provide adequate maternity and child health centres. It is hoped that the Panchayat Unions which are now being inaugurated, will provide necessary maternal and child health services as early as possible.

During the year under report, the Health Education and Publicity section in the Department has been upgraded into a Health Education Bureau according to the pattern of Central Health Education Bureau of the Government of India. The Assistant Director-in-charge of the Bureau and a few other officers have been appointed and steps are being taken for appointing others. The Field Study and Demonstration Centre of the Bureau is being organised at Poonamallee in co-operation with the Health Unit, Research-Cum-Action Project, the Primary Health Centres and the Community

Development Blocks therein. The necessary organisation for training health staff and other personnel in health education methods is being established.

The programme of construction of latrines in all the districts under the scheme for environmental hygiene is being implemented as vigorously as possible.

The work of the officers and public health staff continued to be generally satisfactory.

N. PARTHASARATHY,
Director of Public Health, Madras.

CHART NO.1. MADRAS STATE
BIRTH AND DEATH RATES 1950-60

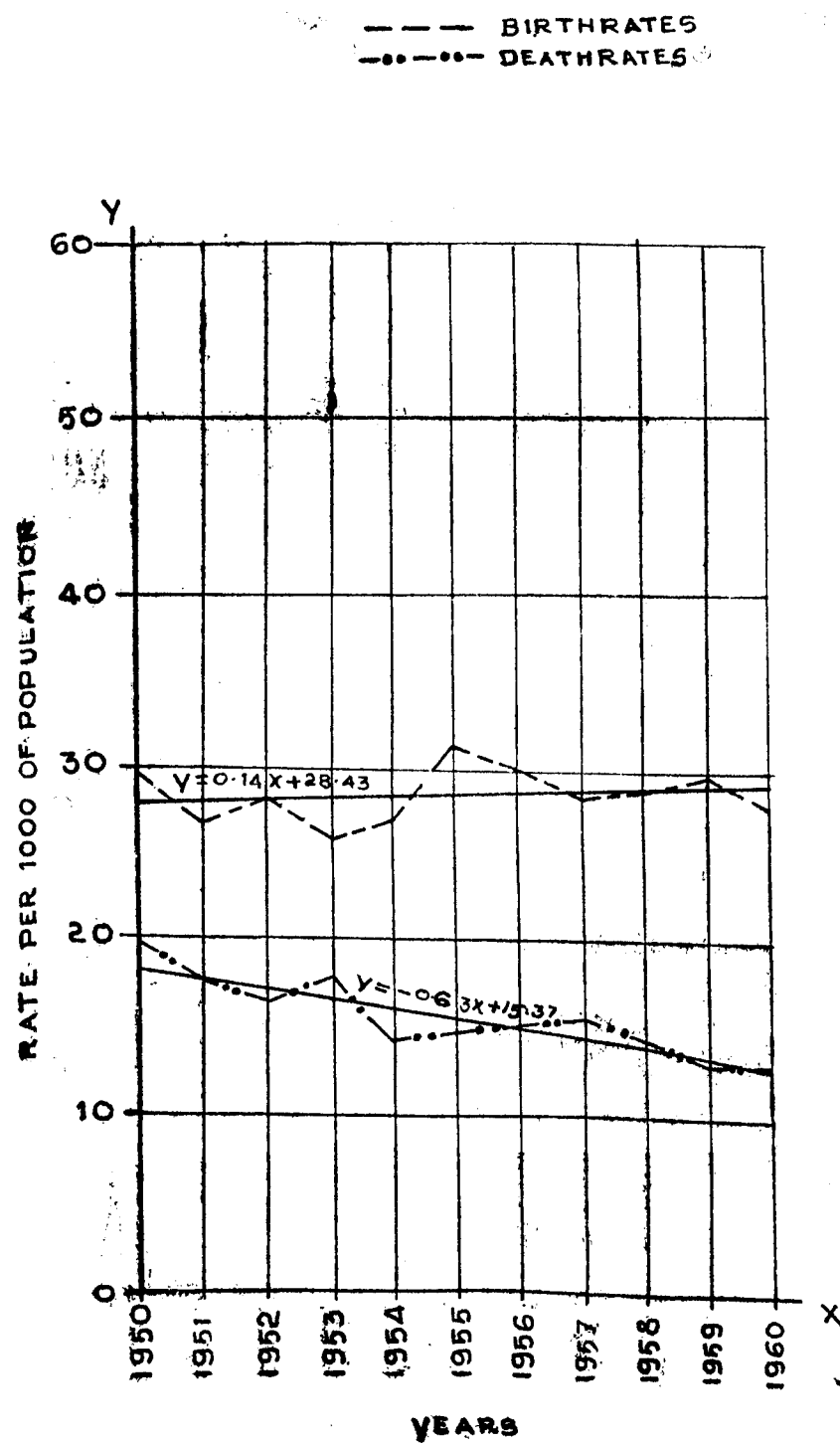


CHART NO.11. MADRAS STATE
INFANT MORTALITY RATES 1950-60

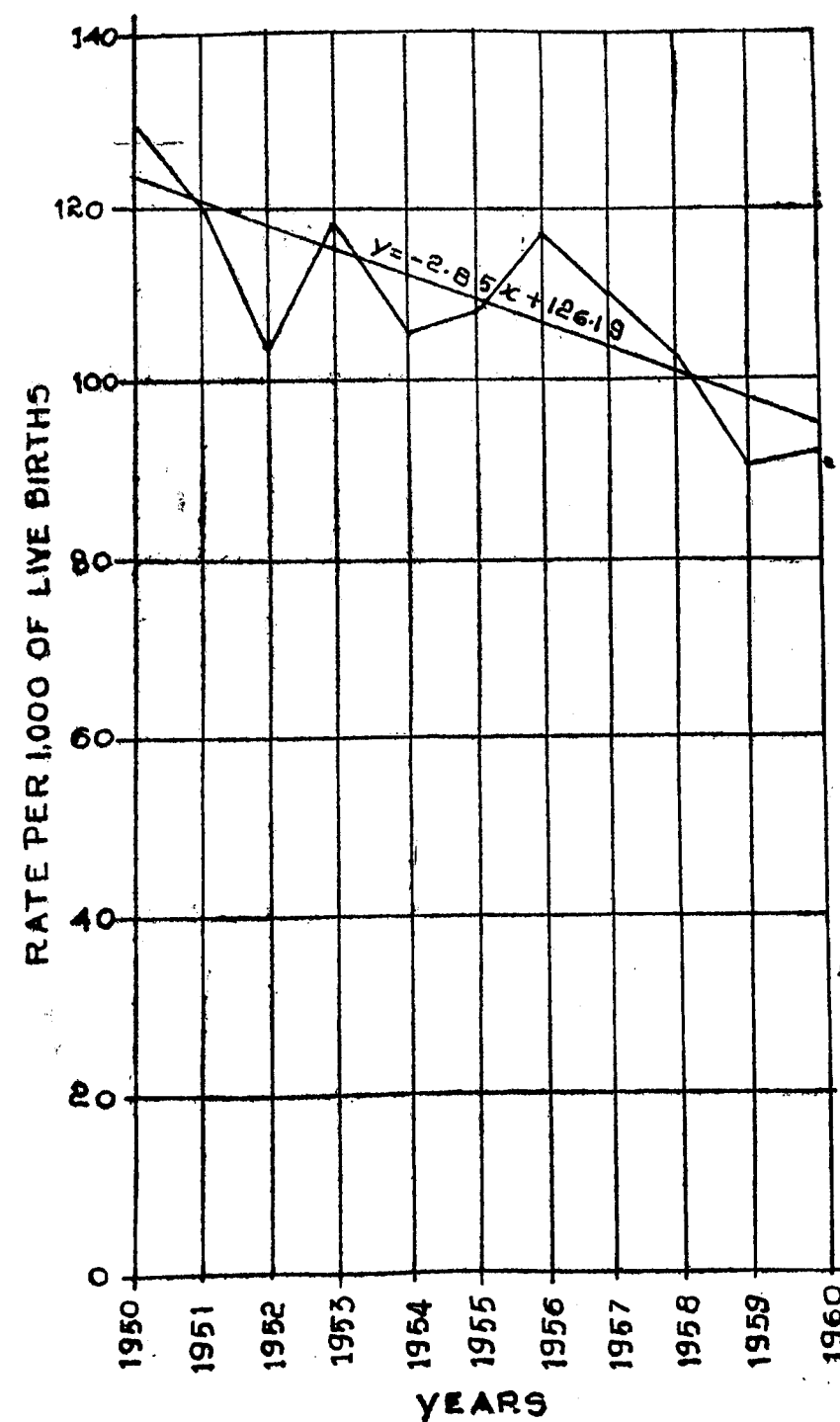
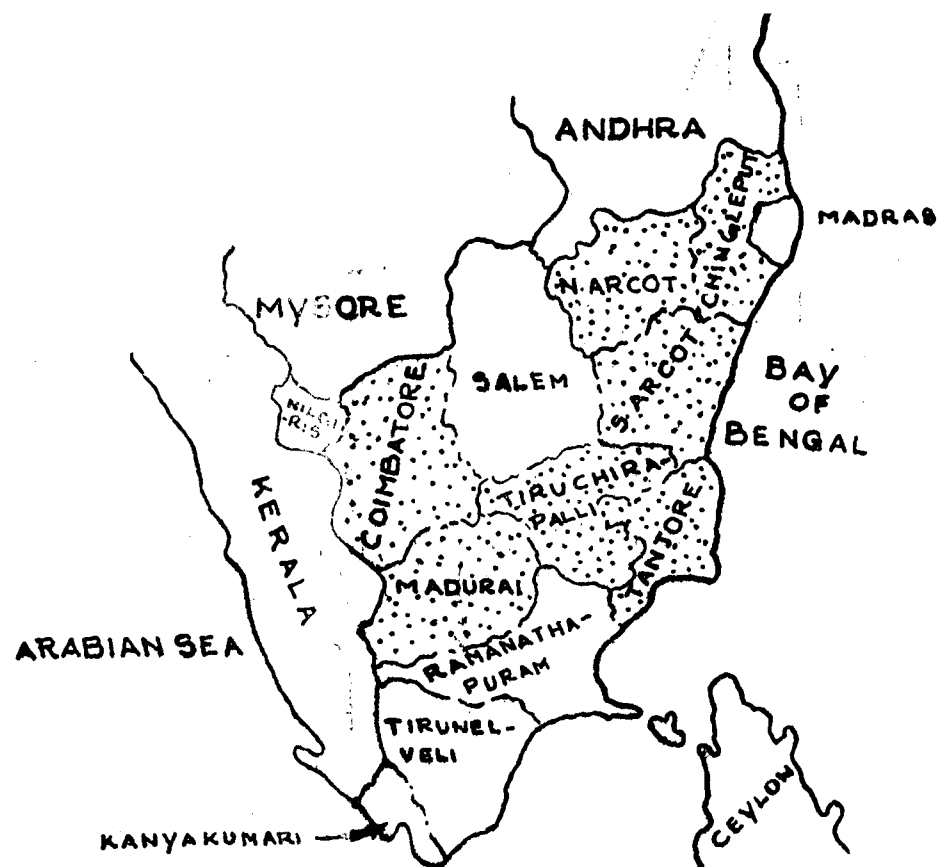


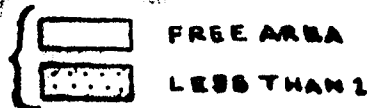
CHART NO. III.

MADRAS STATE
MAP OF CHOLERA MORTALITY RATES
1960

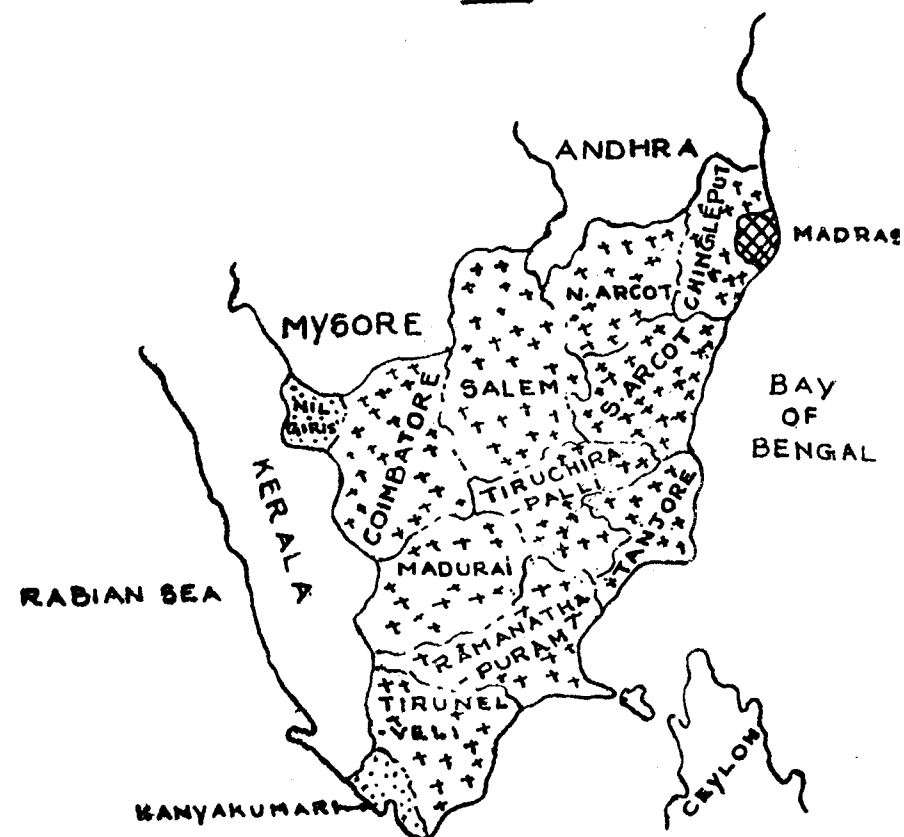


DEATH RATES PER 100,000 OF POPULATION,

LEGEND

CHART NO. IV.

MADRAS STATE
MAP OF SMALL-POX MORTALITY RATES
1960



DEATH RATES PER 100,000 OF POPULATION

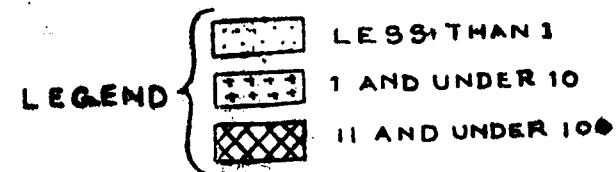
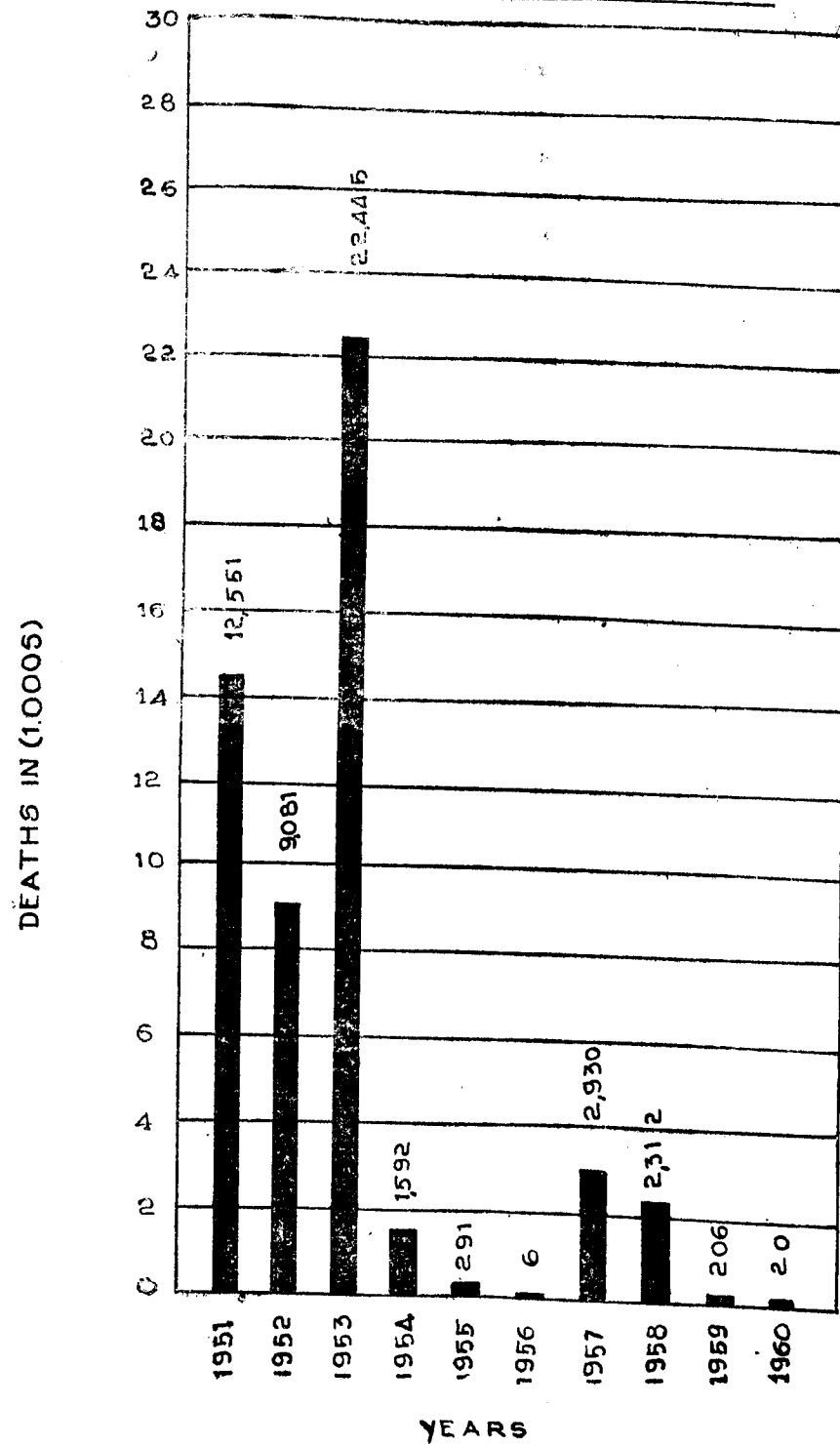
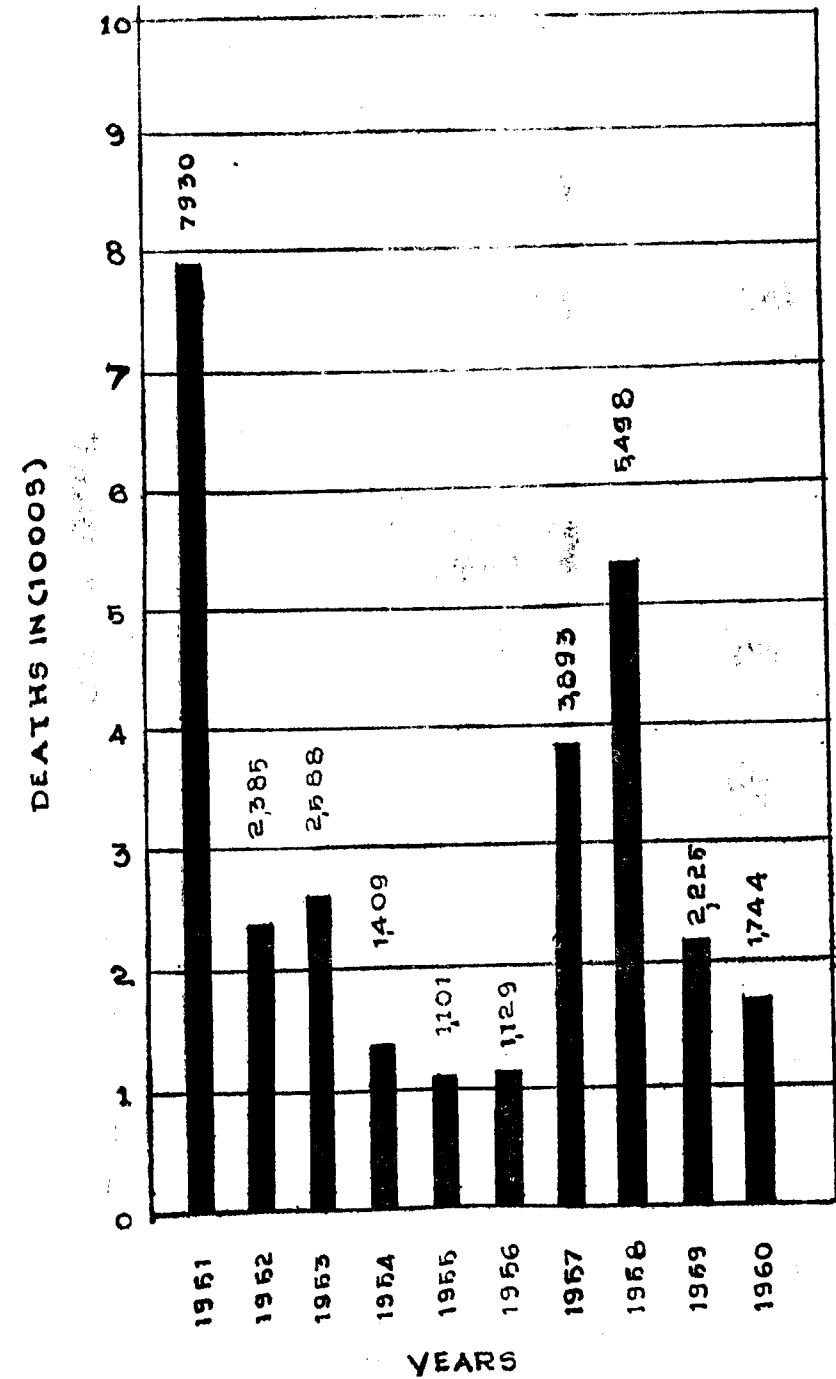


CHART NO. V.MADRAS STATE
DEATHS FROM CHOLERA 1951-60CHART NO. VI.MADRAS STATE
DEATHS FROM SMALLPOX 1951-60

ANNEXURE A.

STATEMENT SHOWING THE NUMBER OF MONTHLY VILLAGE BIRTH AND DEATH RETURNS DUE FROM EACH DISTRICT AND NUMBER NOT RECEIVED FOR THE YEAR 1960.

Serial number and district.	Number of returns due for 1960.	Number of returns received in 1960.	Percentage of returns not received to total number due.
(1)	(2)	(3)	(4)
1 Chingleput	26,421	1,566	5.9
2 North Arcot	24,252	1,703	7.0
3 South Arcot	27,204	3,090	11.4
4 Thanjavur	29,148	936	3.2
5 Tiruchirapalli	19,296	828	4.3
6 Madurai	12,816	165	1.3
7 Ramanathapuram	18,336	1,835	10.0
8 Tirunelveli	13,255	200	1.5
9 Salem	19,363	858	4.4
10 Coimbatore	13,176	645	4.9
11 The Nilgiris	1,872	207	11.1
12 Kanyakumari	912	Nil	Nil
Total ..	206,051	12,033	5.8

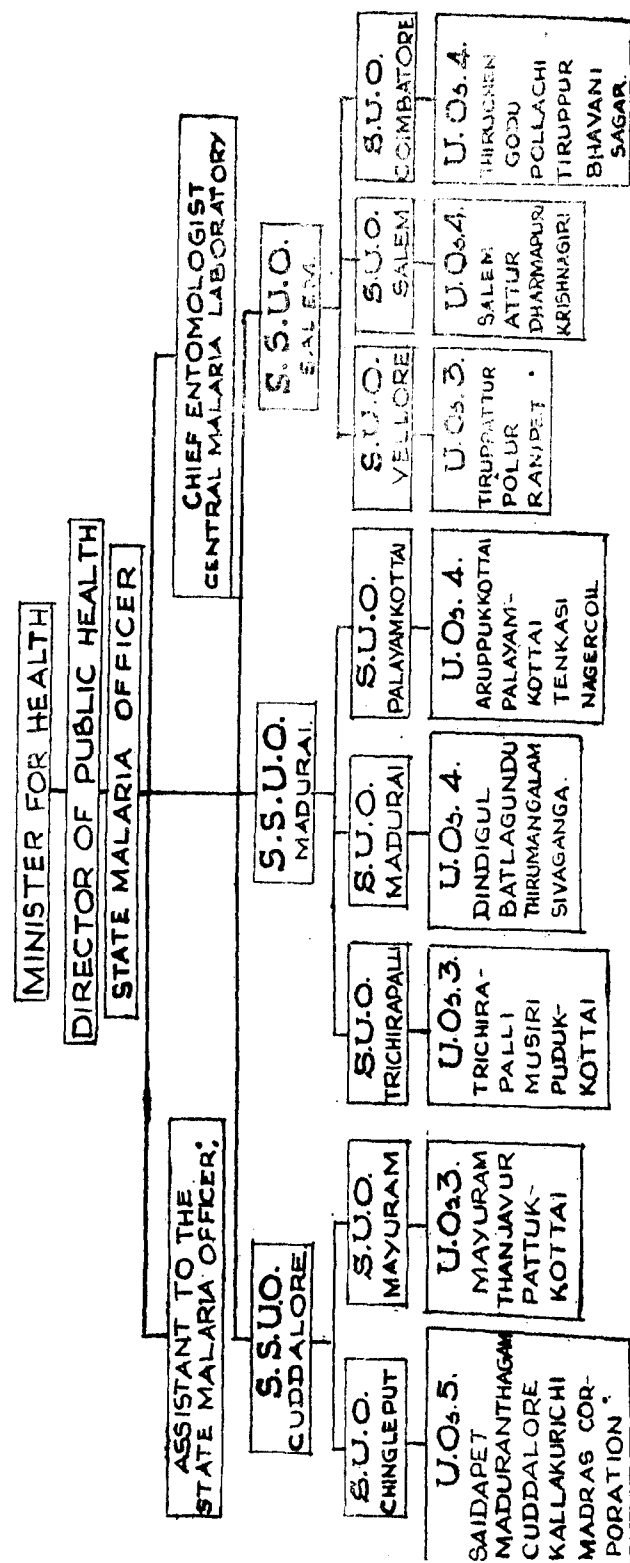
ANNEXURE B.

STATEMENT SHOWING LIVE-BIRTHS BY MONTHS, SEX AND AREA IN MADRAS STATE FOR 1960.

Serial number and names of months.	Rural.			Urban.			Total.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 January	23,137	21,980	45,067	10,758	10,192	20,950	33,895	32,122	66,017
2 February	20,351	18,616	38,967	11,088	10,618	21,706	31,439	29,234	60,673
3 March	21,005	20,093	41,098	12,267	11,637	23,904	34,172	31,730	65,902
4 April	23,137	20,984	44,121	12,895	12,195	25,090	36,032	33,179	69,211
5 May	24,394	22,416	46,810	13,939	13,068	27,007	38,333	35,484	73,817
6 June	25,199	22,846	48,045	13,428	12,748	26,176	38,627	35,594	74,221
7 July	26,928	24,959	51,887	14,128	13,160	27,288	41,056	38,119	79,175
8 August	28,711	26,236	54,947	14,404	13,546	27,950	43,115	39,782	82,897
9 September	28,965	26,384	55,349	13,358	12,266	25,624	42,323	39,150	81,473
10 October	29,872	28,121	57,993	15,281	14,508	29,739	45,103	42,629	87,732
11 November	25,803	24,218	50,051	14,789	14,129	28,868	40,542	38,377	78,919
12 December	24,719	23,001	47,720	16,712	15,600	32,312	41,431	38,601	80,032
Total	308,121	280,334	588,455	162,947	153,467	316,614	466,068	434,001	900,069

CHART No. 7

ORGANISATIONAL CHART OF THE
NATIONAL MALARIA ERADICATION PROGRAMME, MADRAS STATE.



NOTE

S.S.U.O. SPECIAL SUPERVISORY UNIT OFFICER

S.U.O. SUPERVISORY UNIT OFFICER

U.O. UNIT OFFICER

ANNEXURE C.

STATEMENT SHOWING DEATHS BY MONTHS, SEX AND AREA IN
MADRAS STATE FOR 1960.

Serial number and names of months. (1)	Rural.			Urban.			Total.		
	Males. (2)	Females. (3)	Total. (4)	Males. (5)	Females. (6)	Total. (7)	Males. (8)	Females. (9)	Total. (10)
1 January ..	13,640	13,596	27,236	5,278	5,019	10,297	18,918	18,615	37,533
2 February ..	11,755	11,708	23,463	5,425	5,080	10,505	17,180	16,788	33,968
3 March ..	10,660	10,468	21,128	4,873	4,786	9,659	15,533	15,264	30,787
4 April ..	10,359	10,269	20,628	4,462	4,273	8,735	14,821	14,542	29,363
5 May ..	10,694	10,750	21,444	4,939	4,532	9,471	15,638	15,282	30,915
6 June ..	10,619	10,576	21,195	4,580	4,328	8,908	15,199	14,904	30,103
7 July ..	10,859	10,897	21,756	4,330	4,198	8,528	14,989	14,895	29,884
8 August ..	11,242	11,510	22,752	4,723	4,679	9,402	15,965	16,198	32,163
9 September ..	10,745	11,079	21,824	4,156	4,066	8,222	14,901	15,145	30,046
10 October ..	11,983	12,094	24,077	5,002	4,826	9,828	16,985	16,920	33,905
11 November ..	14,737	14,788	29,525	5,556	5,262	10,818	20,293	20,050	40,343
12 December ..	17,485	17,373	35,338	7,144	6,969	14,113	24,600	24,842	49,442
Total ..	144,558	145,417	289,975	60,468	58,018	118,486	205,026	203,435	408,461

ANNEXURE D.

STILL BIRTHS IN THE DISTRICTS EXCLUSIVE OF MUNICIPAL TOWNS AND IN
THE DISTRICTS INCLUSIVE OF MUNICIPAL TOWNS IN 1960.

Serial number and name of districts (1)	Districts exclusive of Municipal Towns.			Municipal Towns.			Districts inclusive of Municipal Towns.		
	Males. (2)	Females. (3)	Total. (4)	Males. (5)	Females. (6)	Total. (7)	Males. (8)	Females. (9)	Total. (10)
1 Madras ..	..	..	..	1,144	1,098	2,242	1,144	1,098	2,242
2 Chingleput ..	209	161	370	183	157	340	392	318	710
3 North Arcot ..	142	103	245	591	492	1,083	733	595	1,328
4 South Arcot ..	93	84	177	212	189	401	305	273	578
5 Thanjavur ..	229	200	429	610	465	1,075	839	685	1,524
6 Tiruchirappalli ..	190	139	329	488	429	916	678	567	1,245
7 Madurai ..	150	100	250	616	578	1,194	766	678	1,444
8 Ramanathapuram ..	236	182	418	308	222	530	544	404	948
9 Tirunelveli ..	285	220	505	327	328	655	612	548	1,160
10 Salem ..	125	109	234	428	529	957	553	638	1,191
11 Coimbatore ..	118	102	220	806	623	1,429	924	725	1,649
12 The Nilgiris, ..	106	74	180	51	41	92	157	115	272
13 Kanyakumari ..	99	85	184	20	31	51	119	116	235
Total ..	1,982	1,559	3,541	5,784	5,181	10,965	7,766	6,740	14,506

ANNEXURE E.

INFANT DEATHS AND DEATH-RATES IN DISTRICTS EXCLUSIVE OF MUNICIPAL TOWNS,
IN MUNICIPAL TOWNS AND DISTRICTS INCLUSIVE OF MUNICIPAL TOWNS IN 1960.

Serial number and name of districts. (1)	Municipal areas.		Districts exclusive of Municipal areas.		Districts inclusive of Municipal areas.	
	Number. (2)	Rate per 1,000 live-births. (3)	Number. (4)	Rate per 1,000 live-births. (5)	Number. (6)	Rate per 1,000 live-births. (7)
1 Madras ..	8,832	121.64	..	..	8,832	121.64
2 Chingleput ..	567	81.24	5,515	108.74	6,082	105.87
3 North Arcot ..	1,952	96.18	7,474	102.31	9,426	100.97
4 South Arcot ..	462	53.20	5,679	93.14	6,141	88.16
5 Thanjavur ..	1,273	61.67	5,776	98.28	7,049	88.73
6 Tiruchirappalli ..	899	57.25	5,969	87.25	6,868	81.65
7 Madurai ..	2,547	67.97	5,573	89.06	8,120	89.33
8 Ramanathapuram ..	940	69.07	3,729	78.99	4,669	76.77
9 Tirunelveli ..	1,202	100.51	7,680	114.75	8,882	112.69
10 Salem ..	371	69.36	5,647	76.21	6,418	75.20
11 Coimbatore ..	2,202	72.39	5,480	89.25	7,688	83.67
12 Nilgiris, The ..	320	97.35	554	74.06	874	81.17
13 Kanyakumari ..	166	34.35	1,224	61.18	1,390	55.96
Total ..	22,233	88.82	60,206	92.66	82,439	91.69

ANNEXURE F.

INFANT DEATHS BY AGE GROUPS IN THE MUNICIPAL TOWNS IN THE STATE OF
MADRAS RECORDED DURING 1960.

Serial number and name of Municipalities. (1)	Under one month.		One to six months.		Six to twelve months.		Total under one year.		Total. (10)
	Males. (2)	Females. (3)	Males. (4)	Females. (5)	Males. (6)	Females. (7)	Males. (8)	Females. (9)	
1 Madras ..	1,817	1,488	1,375	1,272	1,399	1,481	4,591	4,241	8,832
2 Kancheepuram ..	74	65	38	33	42	46	154	144	298
3 Tiruvallure ..	12	6	3	7	9	11	29	24	53
4 Chingleput ..	45	34	13	10	16	18	74	62	136
5 Tiruvottiyur ..	10	12	8	21	12	17	30	50	80
6 Vellore ..	213	128	116	96	95	123	424	347	771
7 Tiruvannamalai ..	56	43	25	23	18	28	99	94	193
8 Gudiyatham ..	61	50	49	44	54	33	164	127	291
9 Vaniyambadi ..	27	21	25	22	24	26	76	69	145
10 Tirupattur ..	27	24	10	13	15	7	52	44	96
11 Walajapet ..	9	4	8	11	7	6	24	21	45
12 Ambur ..	29	28	26	15	16	17	71	60	131
13 Arni ..	43	22	27	18	14	22	84	62	146
14 Arkonam ..	4	4	1	7	5	8	10	19	29
15 Ranipet ..	13	13	9	9	16	11	38	33	71
16 Arcot ..	7	2	7	6	7	5	21	13	34
17 Cuddalore ..	27	47	22	18	31	20	80	85	165
18 Chidambaram ..	24	26	22	30	20	9	64	65	131
19 Villupuram ..	21	15	16	13	12	18	49	46	95
20 Tindivanam ..	14	10	11	7	16	13	41	30	71
21 Thanjavur ..	96	105	43	32	67	42	206	179	385
22 Kumbakonam ..	80	71	39	24	40	28	159	123	282
23 Nagapattinam ..	69	36	48	42	33	20	150	98	248
24 Mayuram ..	45	29	13	20	14	13	72	62	134
25 Mannargudi ..	44	46	13	17	17	7	74	69	143
26 Tiruvarur ..	19	12	13	13	8	16	40	41	81
27 Tiruchirappalli ..	172	130	47	48	76	60	295	238	533
28 Karur ..	34	48	12	9	15	10	61	67	128
29 Srirangam ..	30	20	5	8	10	11	45	39	84
30 Pudukkottai ..	61	47	12	8	11	15	84	70	154
31 Madurai ..	500	428	252	193	212	222	964	843	1,807
32 Dindigul ..	86	44	24	21	26	21	186	86	272
33 Bodinayakanur ..	28	23	5	7	14	11	47	41	88
34 Periakulam ..	50	37	26	18	26	27	102	82	184
35 Palni ..	35	30	12	11	14	19	61	60	121
36 Kodakkal ..	29	11	3	5	10	9	42	25	67
37 Cumbum ..	19	16	5	3	11	4	36	23	59
38 Rajapalayam ..	47	31	20	15	28	35	95	81	176
39 Srivilliputhur ..	52	53	27	18	20	16	99	87	186
40 Virudhunagar ..	84	21	17	13	5	19	69	33	102

ANNEXURE F—cont.

INFANT DEATHS BY AGE GROUPS IN THE MUNICIPAL TOWNS IN THE STATE OF
MADRAS RECORDED DURING 1960—cont.

Serial number and name of municipal localities.	Under one month.		One to six months.		Six to twelve months.		Total under one year.		Total.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
41 Karakudi	23	20	10	10	8	16	41	46	87
42 Devakottai	25	17	9	6	17	15	51	38	89
43 Sivakasi	20	12	10	4	10	7	40	23	63
44 Aruppukottai	39	33	15	23	21	23	76	79	154
45 Ramanathapuram	16	25	7	9	6	9	29	44	73
46 Tuticorin	126	103	66	59	54	67	216	229	445
47 Tirunelveli	115	81	48	36	26	45	187	162	349
48 Palayamkottai	90	102	11	10	25	10	126	122	248
49 Melapalayam	24	16	8	7	12	10	44	33	77
50 Shencottah	24	19	5	4	3	7	32	21	53
51 Salem	97	106	136	146	156	176	389	428	817
52 Rasipuram	22	8	4	5	9	6	35	19	54
53 Coimbatore	423	295	157	150	116	126	696	581	1,277
54 Erode	58	59	27	26	25	22	110	107	217
55 Tiruppur	80	44	24	17	6	14	110	76	185
56 Pollachi	45	59	32	17	23	18	100	94	194
57 Dharapuram	23	19	9	9	10	3	42	31	73
58 Udumalpet	30	25	7	10	5	6	42	41	83
59 Mettupalayam	33	15	6	8	8	12	47	25	82
60 Gobichettipala- yam,	20	11	7	7	8	7	35	25	60
61 Kuriichi	9	7	7	3	1	4	17	14	31
62 Ootacamund	55	49	24	18	30	23	109	95	204
63 Coonoor	43	37	12	9	8	7	63	53	116
64 Nagercoil	38	22	14	22	11	11	63	55	118
65 Colachel	2	4	2	2	5	5	9	11	20
66 Kuzhithurai	2	1	1	1	2	1	6	1	7
67 Padmanabha- puram,	4	7	4	1	2	5	8	15	23
Total	5,549	4,406	3,113	2,829	3,093	3,123	11,755	10,478	22,233

ANNEXURE G.

MATERNAL DEATHS AND DEATH RATES IN DISTRICTS EXCLUSIVE OF MUNICIPAL
TOWNS IN MUNICIPAL TOWNS AND DISTRICTS INCLUSIVE OF MUNICIPAL TOWNS
IN THE STATE OF MADRAS FOR THE YEAR 1960.

Serial num- ber.	Districts.	Municipal Towns.		Districts exclusive of Municipal Towns.		Districts inclusive of Municipal Towns.	
		Number.	Rate per 1,000 births (live and still).	Number.	Rate per 1,000 births (live and still).	Number.	Rate per 1,000 births (live and still).
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1 Madras		1 0	1 59			119	1 59
2 Chingleput		51	7 21	119	2 92	260	3 44
3 North Arcot		80	3 71	160	2 18	240	2 53
4 South Arcot		60	6 60	210	3 43	270	3 84
5 Thanjavur		127	5 84	257	4 34	384	4 74
6 Tiruchirappalli		70	4 21	334	4 86	404	4 73
7 Madurai		151	5 01	171	2 76	322	3 49
8 Ramanathapuram		44	3 11	129	2 71	173	2 64
9 Tirunelveli		102	8 09	270	4 00	372	4 66
10 Salem		85	4 29	172	2 86	257	2 97
11 Coimbatore		107	3 36	156	2 85	263	3 03
12 Nagercoil, Erode,		11	3 26	21	2 74	32	2 00
13 Kanyakumari		14	2 87	95	4 71	109	4 36
Total		1,021	3 91	2,144	3 28	3,165	3 46

ANNEXURE H.

STATEMENT SHOWING BIRTHS AND DEATHS AS PER DETAILED CAUSES AND AS PER AGES AT DEATHS IN MUNICIPAL TOWNS
WITH A POPULATION OF 30,000 AND ABOVE HAVING HEALTH OFFICERS IN THE STATE IN 1960.

Municipal Towns selected : Aruppukottai, Bodinayakanur, Chidambaram, Coimbatore, Cuddalore, Dindigul, Erode, Gudiyatham, Kancheepuram, Karur, Karaiyudi, Kumbakonam, Madras, Madurai, Mayuram, Nagapattinam, Ootacamund, Palani, Palayamkottai, Periyakulam, Pollachi, Pudukkottai, Rajapalayam, Salem, Srirangam, Srivilliputhur, Thanjavur, Tiruchirappalli, Tirunelveli, Tiruppur, Tiruvannamalai, Tuticorin, Vaniyambadi, Vellore, Villupuram and Virudhunagar.

Age at the time of death.	Estimated Mid-year Population for 1960.	Infectious Diseases.										Fever.				Respiratory Diseases.			
		(3) Cholera.	(4) Plague.	(5) Small-pox.	(6) Measles.	(7) Chicken-pox.	(8) Typhoid or enteric fever.	(9) Diphtheria.	(10) Others.	(11) Malaria.	(12) Influenza.	(13) Relapsing fever.	(14) Kala Azar.	(15) Rheumatic fever.	(16) Other fevers.	(17) Tuberculosis of Lungs.	(18) Pneumonia.	(19) Others.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	
Under 24 hours	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Twenty-four hours and under one week	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
One week and under one month	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
One month and under three months	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Three months and under six months	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Six months and under one year	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Total under one year	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
1 and under 5 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
5 and under 10 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
10 and under 15 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
15 and under 20 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
20 and under 25 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
25 and under 30 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
30 and under 35 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
35 and under 40 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
40 and under 45 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
45 and under 50 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
50 and under 55 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
55 and under 60 years	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
60 years and upwards	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
Total of all ages	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	

ANNEXURE H—cont.

STATEMENT SHOWING BIRTHS AND DEATHS AS PER DETAILED CAUSES AND AS PER AGES AT DEATHS IN MUNICIPAL TOWNS WITH A POPULATION OF 30,000 AND ABOVE HAVING HEALTH OFFICERS IN THE STATE IN 1960—cont.

Municipal towns selected: Aruppukottai, Bodinayakanur, Chidambaram, Coimbatore, Cuddalore, Dindigul, Erode, Gudiyatham, Kancheepuram, Karur, Karaikudi, Kumbakonam, Madras, Madurai, Mayuram, Nagapattinam, Ootacamund, Palani, Palayambottai, Peryambalam, Pollachi, Pudukkottai, Rajapalayam, Salem, Srirangam, Srivilliputtur, Thanjavur, Tiruchirappalli, Tirunelveli, Tiruppur, Tiruvannamalai, Tuticorin, Vaniyambadi, Vellore, Villupuram and Virudhunagar—cont.

Age at the time of death.	Alimentary System.			Disease of the liver.		Circulatory System.		Genito-urinary diseases excluding venereal diseases.		Venereal Diseases.		
	Dysentery.	Diarrhoea.	Others.	Cirrhosis.	Others.	Heart disease.	Arterio-sclerosis.	Others.	Bright's diseases.	Syphilia.	Gonorrhoea.	Others.
1 Under 24 hours ..	..	2	1	1	1	3	..	3	1	..	..	1
2 Twenty-four hours and under one week ..	..	20	16	3	4	1	..	17	..	..	..	..
3 One week and under one month ..	27	63	24	13	2	1	..	4	..	2	..	2
4 One month and under three months ..	36	61	14	9	1	7	..	20	1	3	3	..
5 Three months and under six months ..	247	474	135	33	16	5	..	23	4	..	4	..
6 Six months and Under one year ..	561	697	170	67	39	5	..	75	6	11	7	3
Total under one year ..	874	1,317	340	131	63	21	..	75	6	22	7	3
1 and under 5 years ..	2,777	1,333	301	290	115	31	..	90	55	1	2	4
5 and under 10 years ..	457	176	65	67	23	24	..	45	27	..	2	..
10 and under 15 years ..	110	66	26	30	22	52	1	42	19	..	..	3
15 and under 20 years ..	85	51	44	28	43	36	..	93	20	..	..	..
20 and under 30 years ..	148	172	153	76	43	301	8	292	48	4	1	7
30 and under 40 years ..	173	134	162	81	51	361	5	274	41	1	2	3
40 and under 50 years ..	241	176	174	89	39	452	10	315	71	1	..	9
50 and under 60 years ..	236	225	177	70	43	526	21	402	149	3	..	3
60 years and upwards ..	226	216	118	66	38	524	15	449	193	..	..	..
Total of all ages ..	4,337	9,865	1,580	918	469	2,441	60	2,077	593	20	14	33

Age at the time of death.

Age at the time of death.	Diseases of the nervous system.					Accident of pregnancy and Child-birth.			Deficiency diseases.		Malignant Diseases.				
	Convulsions.	Cerebral haemorrhage (apoplexy).	Tetanus.	Epilepsy.	Others.	Puerperal Septic.	Abortion.	Other accidents and diseases of pregnancy and parturition.	Beri-Beri.	Hickets.	Others.	Genito-urinary.	Breast.	Other regions.	Ankylostomiasis.
1 Under 24 hours ..	40	1	4	..	15	..	..	1	..	..	1	..	..	..	..
2 Twenty-four hours and under one week ..	279	7	35	4	35	..	..	9	..	..	25	..	..	..	..
3 One week and under one month ..	576	..	50	..	15	..	..	2	..	..	3	..	..	..	..
4 One month and under three months ..	295	..	2	..	9	..	..	..	..	..	15	..	..	..	..
5 Three months and under six months ..	571	..	5	..	76	..	..	..	..	..	64	..	..	..	..
6 Six months and under one year ..	862	..	13	4	58	..	..	..	..	..	38	..	..	..	..
Total under one year ..	2,563	8	109	9	203	..	..	12	..	65	157	1	..	11	3
1 and under 5 years ..	1,593	5	60	9	181	..	..	..	4	101	245	3	1	35	3
5 and under 10 years ..	109	1	97	11	82	..	..	..	..	28	20	4	..	9	..
10 and under 15 years ..	25	4	49	17	22	..	..	..	..	..	19	1	..	9	..
15 and under 20 years ..	25	4	38	15	66	35	13	61	..	..	77	6	..	39	..
20 and under 30 years ..	10	23	120	19	137	87	38	329	1	..	77	8	..	101	2
30 and under 40 years ..	11	25	127	16	112	48	37	232	..	..	100	9	1	108	8
40 and under 50 years ..	8	31	163	7	172	13	5	28	..	..	124	22	2	107	1
50 and under 60 years ..	9	30	37	4	312	1	..	1	..	..	138	19	..	87	1
60 years and upwards ..	4	23	16	5	449	..	..	..	..	..	198	8	..	107	1
Total of all ages ..	4,337	159	716	112	1,726	184	92	683	5	189	1,009	53	5	516	24

Age at the time of death.

ANNEXURE H—cont.

STATEMENT SHOWING BIRTHS AND DEATHS AS PER DETAILED CAUSES AND AS PER AGES AT DEATHS IN MUNICIPAL TOWNS WITH A POPULATION OF 30,000 AND ABOVE HAVING HEALTH OFFICERS IN THE STATE IN 1960—cont.

Municipal towns selected: Aruppukottai, Chidambaram, Coimbatore, Cuddalore, Dindigul, Erode, Gudiyatham, Kancheepuram, Karur, Karaikudi, Kumbakonam, Madras, Mayuram, Nagapattinam, Ootacamund, Palani, Palayamkottai, Periyakulam, Pollachi, Pudukottai, Rajapalayam, Salem, Srirangam, Srivilliputhur, Thanjavur, Tiruchirappalli, Tirunelveli, Tiruppur, Tiruvannamalai, Tuticorin, Vaniyambadi, Villore, Viluppuram and Virudhunagar—*cont.*

Age at the time of death.	(50)	(51)	(52)	(53)	(54)	(55)	(56)	(57)	(58)	(59)	(60)	(61)	Remarks.
	Leprosy.	Alcoholism.	Congenital debility, premature births, and malformation.	Rabies.	Wounds and accidents.	Snake-bite and scorpion stings, etc.	Killed by wild beasts.	Suicides.	Poisons.	Old age.	All other causes.	Total deaths from all causes	
1 Under 24 hours	..	..	1,342	..	1	..	..	..	..	..	147	1,632	Males. Females. Total.
2 Twenty-four hours and under one week	..	..	3,193	..	3	..	..	..	..	..	557	4,546	110,304 105,135 215,439
3 One week and under one month	..	..	1,516	..	1	..	..	..	..	..	206	2,669	42,603 41,017 83,620
4 One month and under three months	..	..	335	..	1	..	..	..	..	..	14	1,194	4,971 4,558 9,499
5 Three months and under six months	..	..	309	..	4	..	..	..	..	..	551	4,204	20,899 19,422 40,811
6 Six months and under one year	..	..	231	..	10	2	..	..	2	..	631	5,697	15,890 15,588 31,478
Total under one year	..	..	6,925	..	23	2	..	..	2	..	2,193	19,972	43,112 41,129 84,241
1 and under 5 years	..	..	139	10	79	8	..	5	13	..	1,970	16,514	per 1,000
5 and under 10 years	..	..	3	29	98	6	1	1	8	..	231	3,146	births (live
10 and under 15 years	..	..	3	22	63	3	..	14	159	..	1,429	1,923	and still births).
15 and under 20 years	..	..	1	19	37	17	..	36	210	..	210	1,923	
20 and under 25 years	..	..	1	1	28	17	..	37	70	..	1,003	5,403	
25 and under 30 years	..	..	6	14	163	8	..	56	45	1	1,082	5,209	
30 and under 35 years	..	..	10	15	132	6	..	33	96	..	1,179	5,436	
35 and under 40 years	..	..	20	16	104	..	..	35	95	..	1,545	6,365	
40 and under 45 years	..	..	4	8	132	3	..	18	12	148	2,070	18,223	
45 and under 50 years	..	..	74	8	132	..	..	..	..	11,685	11,601	83,620	
50 and under 55 years	..	..	..	..	..	..	..	..	..	..	..	..	
55 and under 60 years	..	..	..	..	..	..	..	..	..	..	..	..	
60 years and upwards	..	..	..	..	..	..	..	..	..	..	..	..	
Total of all ages	113	..	7,186	163	1,142	61	1	295	240	11,834	11,601	83,620	

ANNEXURE I.

BIRTH AND DEATH RATES CORRECTED FOR NON-RECEIPT OF BIRTH
AND DEATH RETURNS.

Serial number and districts.	Birth Rate.		Death Rate.	
	1960. (2)	1959. (3)	1960. (1)	1959. (5)
(1)				
1 Chingleput	28.6	30.2	13.7	14.4
2 North Arcot	31.1	35.3	15.5	14.6
3 South Arcot	26.2	28.9	13.4	11.7
4 Thanjavur	24.0	26.9	11.0	11.4
5 Tiruchirappalli ..	26.6	27.3	12.8	11.7
6 Madurai	27.9	30.3	12.0	12.5
7 Ramanathapuram ..	30.2	30.6	13.7	12.8
8 Tirunelveli	29.4	32.2	15.5	14.4
9 Salem	23.0	24.3	9.3	9.6
10 Coimbatore	28.5	27.9	10.0	10.8
11 The Nilgiris	28.6	32.1	8.0	16.0
12 Kanyakumari	25.7	29.5	9.4	9.9
Total	27.8	29.7	12.7	12.5

ANNEXURE J.

MATERNITY AND CHILD HEALTH SERVICES (out turn of work in 1960):

Serial number.	Districts (exclusive of Municipalities).	Municipalities including Corporation of Madras.	Total.
(1)	(2)	(3)	(4)
I. Brought under care—			
Total number of Mothers	4,70,856	2,16,242	6,87,098
Prenatal	4,07,677	1,84,686	5,92,363
Labours	1,29,087	1,01,402	2,30,489
Infants	1,44,104	99,027	2,43,131
Pre-school	82,269	54,726	1,36,995
II. Home visits—			
(a) Women Medical Officers	21,180	43,465	64,645
(b) Health Visitors—			
Prenatal	1,78,940	71,102	2,50,042
Postnatal	1,29,787	48,398	1,78,185
Infants	1,02,028	1,77,992	2,80,020
(c) Maternity Assistants—			
Prenatal	6,94,623	5,95,656	14,90,279
Postnatal	7,12,506	5,28,830	12,41,336
Infants	5,10,500	2,71,338	7,81,838
III. Clinics—			
Number of Clinics held	22,033	59,887	81,920
Prenatal	1,75,374	2,43,548	4,19,922
Nursing Mothers	74,860	60,371	1,35,231
Infants	87,719	64,842	1,52,561
Pre-school	99,998	35,467	1,35,465
IV. Other activities—			
Number of Mother's classes held	23,638	8,958	32,596
Attendance	2,04,807	2,25,710	4,30,517
V. Milk distribution—			
Mothers	2,46,947	3,81,069	9,26,016
Children	8,34,521	10,09,221	18,43,742
VI. Lantern Lectures—			
Number given	82	768	850
Attendance	870	20,510	21,380
VII. School visits for Health Education—			
Number of schools visited	3,528	245	3,773
Number of health talks given	4,863	921	5,784
Attendance	1,27,467	68,176	2,95,643

ANNEXURE K.

STATEMENT SHOWING THE MATERNITY AND CHILD WELFARE CENTRES AND HOMES MAINTAINED AND THE STAFF DURING THE YEAR 1960.

Serial number and name of the districts.	Maternity and Child Welfare Centres and Homes maintained by															Total				
	Government.			Local bodies.			Voluntary agencies.			Resident Matron.			Health Visitors.		Women Medical Officers.		Stat.			
	R	U	(8)	R	U	(6)	R	U	(7)	R	U	(10)	U	(11)	R			U	(13)	R	U	(15)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)						
1 Chingleput	90	..	41	10	15	..	3	2	..	..	12	2	153	19						
2 Poonamallee Health Unit	8	..	..	..	..	..	2	3	..	..	4	..	18	..						
3 South Arcot	92	..	25	17	11	2	1	2	..	..	12	1	137	23						
4 North Arcot	95	..	18	14	22	4	4	..	..	..	12	2	127	48						
5 Thanjavur	111	..	38	16	23	..	1	4	..	..	20	3	169	39						
6 Tiruchirappalli	88	..	19	19	20	3	6	9	..	..	14	8	188	42						
7 Madurai	108	..	25	22	12	21	1	6	..	..	17	10	177	89						
8 Ramanathapuram	112	..	65	24	..	1	1	3	..	..	14	3	214	36						
9 Tirunelveli	98	..	15	25	67	2	2	18	..	..	12	3	198	42						
10 Coimbatore	137	..	30	30	6	3	2	2	..	..	22	11	198	101						
11 Salem	101	..	42	12	10	1	..	2	..	..	11	4	129	25						
12 The Nilgiris	43	..	10	8	5	1	..	..	..	..	6	2	56	15						
13 Kanyakumari	55	..	2	8	..	..	..	3	..	..	5	3	60	56						
14 Madras	..	..	..	43	..	..	..	31	..	..	1	88	..	290						
																</				

HEALTH OF MINOR PORTS IN 1960.

Serial number and name of the ports.	Arriving vessels.						Coastal.					
	Foreign.			Passenger vessels.			Cargo vessels.			Passenger vessels.		
	Cargo vessels.	Passenger vessels.	Total vessels.	Crew inspected.	Inspected.	Crew inspected.	Cargo vessels.	Passenger vessels.	Total Vessels.	Inspected.	Crew Inspected.	Cargo vessels.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Cuddalore	39	39	..	..	..	..	22	22	..	..	..	..
2 Dhanushkodi	..	..	..	248	44,345	10,664	..	..	..	..	..	..
3 Nagapattinam	225	..	..	25	10,671	..	20	..	..	..	..	..
4 Kilakarai	21	..	..	..	..	..	200	..	..	..	..	..
5 Adirampattinam ..	..	..	..	..	..	..	..	..	..	..	..	..
6 Porto Novo	..	..	..	..	..	..	..	..	..	..	..	..
7 Kulasekarapattinam	..	..	..	..	..	..	..	..	..	..	..	..
8 Tuticoria	624	251	6,203	..	..	..	440	..	..	..	..	..
9 Pambai	..	..	..	..	..	..	49	..	452	..	..	..

C — Income above Rs. 100.

ANNEXURE N-1.

AVERAGE DAILY CONSUMPTION OF FOODSTUFFS IN OUNCES PER CONSUMPTION UNIT—1960.

(1)	Weavers in Kanchipuram and Arni Municipalities.			Miscellaneous type of workers in Tiruvottiyur Municipality, Tambaram and Poonamallee Panchayats.			Skilled workers in Tiruvottiyur Municipality.			Agriculturists in Jayadhi Hill in Nammiappattu (North Arcot District).			Agriculturists in Varadarajapuram and Ariyamanjalloor (Chingleput district).		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Foodstuffs															
Rice—Raw Milled ..	..	0.3	0.2	..	1.6	2.5	..	..	4.8	..	..	..	..	0.2	..
Rice—Boiled Milled ..	..	17.1	14.9	14.7	11.2	9.1	0.1	..	10.7	0.1	..	..	13.4	15.8	13.0
Rice—Raw and handpounded ..	..	..	..	..	..	..	..	0.8	..	..	..	..	..	..	..
Wheat ..	..	0.2	0.6	..	0.5	1.6	..	..	1.7	..	..	..	..	..	..
Ragi ..	..	0.1	0.5	..	0.5	..	..	..	*	11.7	7.2	..	0.2	0.1	0.1
Others ..	..	..	..	..	..	..	..	..	*	5.9	10.3	..	0.9	1.6	0.2
Total cereals ..	17.4	15.9	15.7	14.7	13.7	13.3	17.7	18.3	17.2	17.7	18.3	14.6	17.6	17.6	13.2
Redgram dhal ..	..	1.2	0.8	0.5	0.5	0.7	..	..	1.0	..	..	0.6	0.8	0.6	..
Bengalgram dhal ..	..	0.1	0.1	0.1	0.1	0.1	..	..	0.1	..	..	..	0.1	..	*
Bengalgram roasted ..	..	*	*	..	*	*	..	..	0.1	..	..	..	*	*	0.2
Blackgram dhal ..	..	0.1	0.4	0.2	0.2	0.3	..	..	0.6	..	..	0.1	*	*	..
Field Beans dry ..	..	*	..	*	*	..	0.7	1.9	*	0.7	1.9	..	*	*	..
Others ..	..	0.1	0.1	..	..	..	0.3	0.2	0.1	0.3	0.2	..	*	*	..
Total pulses ..	1.4	1.2	1.4	0.8	1.0	1.1	1.0	2.0	1.9	1.0	2.0	0.7	0.9	0.9	0.9
Leafy vegetables ..	..	0.4	0.4	0.6	0.3	0.4	*	..	0.7	*	..	0.3	0.5	0.5	0.2
Other vegetables ..	..	2.5	1.3	1.4	1.1	1.3	0.2	..	1.6	0.2	..	1.1	1.3	0.9	0.9
Roots and tubers ..	..	2.0	1.1	0.7	0.9	1.3	0.2	0.1	1.7	0.2	0.1	0.9	0.8	0.5	0.5
Total vegetables ..	4.9	4.3	2.8	2.7	2.3	3.0	0.4	0.1	4.0	0.4	0.1	2.3	2.6	1.6	1.6

Cow's milk	..	1.1	0.9	0.5	0.9	2.7	2.3	..	..	1.0	0.4	0.9
Buffalo's milk	..	..	0.2	..	0.2	0.1	1.7	0.1	1.3	0.3	0.4	1.2
Milk products—curds	..	1.3	0.7	..	*	0.1	0.2	..	..	*	0.1	0.3
Milk products—Buttermilk	..	..	..	..	*	0.4	..	..	..	..	*	..
Milk and Milk products	..	2.4	1.8	4.5	1.1	3.3	4.2	..	..	1.3	1.0	2.4
Ghee	..	..	0.1	..	*	0.2	..	..	..	..	..	..
Vegetable oil	..	0.3	0.2	0.2	0.4	0.6	..	*	*	0.2	0.2	0.2
Fruits	..	0.7	0.3	0.3	0.5	0.5	0.9	..	..	0.8	0.2	0.2
Nuts	..	*	0.1	0.2	0.2	0.3	0.3	..	..	*	*	*
Sugar and Jaggery	..	0.4	0.2	0.1	0.5	0.7	1.1	..	*	0.3	0.5	0.6
Fish	..	..	0.1	0.3	0.3	0.5	0.8	..	..	0.6	0.4	0.4
Eggs	..	..	0.1	..	*	0.1	0.2	..	..	*	*	0.1
Meat—Mutton	..	0.1	0.1	0.3	0.3	0.3	0.5	..	..	0.2	0.3	0.2
Meat—others	..	..	*	..	*	*	0.1	..	..	..	..	*
Condiments	..	0.9	1.0	1.1	0.9	1.0	1.4	0.4	0.3	0.8	0.8	0.6
Other Foodstuffs	..	1.0	0.9	2.0	1.0	0.7	0.9	..	..	0.1	0.5	0.3

* Less than 0.1.

A—Income below Rs. 50.

B—Income Rs. 50—100.

C—Income above Rs. 100.

ANNEXURE N-2.

AVERAGE DAILY INTAKE OF NUTRIENTS PER CONSUMPTION UNIT—1960.

(1) Nutrients.	Weavers in Kancheepuram and Arad Municipalities.			Miscellaneous type of workers in Tiruvottiyur Municipality, Tambaram and Poonamallee Panchayats.			Skilled workers in Tiruvotiyur Municipality.			Agriculturists in Javadhi Hills in Nampanattu (North Arcot District).			Agriculturists in Varadarajapuram and Ariyamandalapuram (Chingleput district 867).		
	A (2)	B (3)	C (4)	A (5)	B (6)	C (7)	A (8)	B (9)	C (10)	A (11)	B (12)	C (13)	A (14)	B (15)	C (16)
Animal Protein (grammes) ..	2.3	2.1	6.3	3.8	5.1	9.0	14.0	0.2	1.6	6.7	5.8	7.1	6.7	5.8	7.1
Vegetable Protein (grammes).	48.3	42.1	44.9	37.1	38.1	40.3	54.9	48.2	62.0	34.8	41.6	32.4	34.8	41.6	32.4
Total Protein (grammes) ..	50.6	44.2	51.2	40.9	43.2	49.3	68.9	48.4	63.7	41.5	47.4	39.5	41.5	47.4	39.5
Fat (grammes) ..	16.9	14.4	28.6	13.3	22.0	35.7	44.6	14.6	19.8	11.3	12.9	15.3	11.3	12.9	15.3
Carbohydrate (grammes) ..	473.6	416.8	448.8	384.2	365.8	333.3	374.9	396.8	411.4	368.8	444.4	347.3	368.8	444.4	347.3
Calcium (grammes) ..	0.5	6.4	0.5	0.3	0.4	0.4	0.6	1.2	0.9	0.3	0.5	0.3	0.3	0.5	0.3
Phosphorous (grammes) ..	1.1	0.9	1.0	0.9	0.9	1.0	1.3	1.6	1.9	0.9	1.0	0.8	0.9	1.0	0.8
Iron (Milli grammes) ..	24.9	20.2	22.0	23.0	19.6	20.9	28.0	31.6	23.1	7.0	22.0	14.6	7.0	22.0	14.6
Vitamin A (I.U.) ..	102.8	94.2	252.4	32.6	97.5	299.6	567.6	7.2	61.5	76.2	66.7	116.8	76.2	66.7	116.8
Carotene (International Vita- min A Unit).	1,109.7	1,007.8	1,066.7	1,163.7	847.2	949.3	1,205.6	174.8	626.2	1,244.1	1,419.2	622.8	1,244.1	1,419.2	622.8
Vitamin B-1 (Milli grammes).	1.3	1.2	1.2	1.1	1.0	1.2	1.4	2.1	2.2	1.1	1.3	1.2	1.1	1.3	1.2
Nicotinic Acid (Milli grammes).	21.1	18.5	19.9	18.4	15.3	14.4	19.8	6.5	10.2	16.7	21.4	16.1	16.7	21.4	16.1
Riboflavin (Milli grammes).	0.4	0.1	0.5	0.2	0.3	0.5	0.7	0.3	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Vitamin C (Milli grammes).	60.2	30.4	38.5	46.5	30.1	38.2	48.8	4.0	10.2	28.9	41.2	25.9	28.9	41.2	25.9
Total Calories ..	2,246.6	1,974.9	2,008.9	1,820.3	1,833.0	2,018.6	2,650.0	1,878.3	2,074.4	1,739.7	2,084.6	1,637.3	1,739.7	2,084.6	1,637.3

A—Income below Rs. 50.

B—Income Rs. 50—100.

C—Income above Rs. 100.

ANNEXURE O-1.

AVERAGE DAILY CONSUMPTION OF FOODSTUFFS IN OUNCES PER CONSUMPTION
UNIT IN THE INSTITUTIONS SURVEYED IN 1960.

Name of the foodstuffs.	Name of the institution—Month of survey.					
	(1)	(2)	(3)	(4)	(5)	(6)
Total consumption week.	unit per	1,390.4	3,509.2	2,012.3	5,692.83	263.2
Rice, raw, milled		1.1	1.2	..	..	4.3
Rice, boiled, milled		10.0	12.4	18.4	18.6	2.1
Wheat		..	3.3	..	..	2.5
Ragi		2.1	0.2	..	2.0	..
Others		..	0.5	..	..	..
Total cereals		13.2	17.5	18.4	20.6	8.9
Redgram dhal		0.5	1.4	1.7	2.9	0.2
Bengalgram dhal		*	0.3	..	..	0.2
Blackgram dhal		*	0.2	..	0.1	*
Greengram dhal		..	0.1	..	..	0.1
Others		0.2	0.1	..	..	0.3
Total pulses		0.7	2.2	1.7	3.0	0.8
Leafy vegetables		0.2	0.2	0.4	1.1	0.2
Other vegetables		2.1	1.3	3.1	2.7	0.4
Roots and tubers		0.3	1.1	2.0	3.6	1.3
Total vegetables		2.6	2.7	5.5	7.4	1.9
Skimmed milk		..	3.4	..	*	1.3
Milk products		2.5	..	2.2	3.0	..
Total milk and milk products.		2.5	3.4	2.2	3.0	1.3
Vegetable oil		0.1	0.6	0.3	0.8	0.1
Fruits		0.2	..	..	..	..
Nuts		..	..	..	0.4	0.2
Sugar and jaggery		..	0.5	..	0.1	0.1
Fish		..	..	1.7	..	..
Meat—Mutton		..	..	..	0.2	0.2
Condiments		0.5	0.7	0.8	1.3	0.3

* Less than 0.1.

ANNEXURE O-2.

AVERAGE DAILY INTAKE OF NUTRIENTS PER CONSUMPTION UNIT IN THE INSTITUTIONS SURVEYED IN 1960.

(1)	Name of the institution.				
	(2)	(3)	(4)	(5)	(6)
	Devarabandhu Ashram Hostel, Walajpet, North Arcot district.	Daya Sadan Home, Madras.	Corporation Special Home, Madras.	Government Care Camp, Melpakkam, near Vadi.	Ozhukkullayam Orphanage (Chinglepet district).
Nutrients :—					
Animal Protein (gms.) ..	2.1	2.4	14.0	4.0	13.5
Vegetable Protein (gms.) ..	31.2	54.4	47.3	66.5	28.7
Total Protein (gms.) ..	33.3	56.8	61.3	70.5	42.2
Fat (gms.)	8.8	24.1	16.3	37.0	8.9
Carbohydrate (gms.) ..	325.0	455.7	471.6	561.9	237.5
Calcium (gms.)	0.5	0.4	0.4	0.7	0.7
Phosphorous (gms.) ..	0.8	1.2	1.1	1.3	0.9
Iron (mgms.)	15.2	23.4	23.8	28.6	11.6
Vitamin A (I.U.)	95.4	..	95.1	111.5	..
Carotene (International Vitamin A Unit).	560.2	338.1	230.6	1,047.4	808.8
Vitamin B1 (mgms.) ..	1.0	1.1	1.5	2.0	0.4
Nicotinic Acid (mgms.) ..	12.9	16.3	24.3	32.4	4.8
Riboflavin (mgms.) ..	0.2	0.4	0.4	0.6	0.2
Vitamin C (mgms.)	25.6	46.5	23.9	61.9	16.1
Total Calories ..	1,513.2	2,270.0	2,274.0	2,861.0	1,206.0

(gms.) = Grammes.

(mgms.) = Milligrammes.

ANNEXURE P.

RESULTS OF NUTRITION SURVEYS CONDUCTED DURING 1960.

		Males 822.					Females 348.				
		0	1	2	3	Percentage of deficiency. (7)	0	1	2	3	Percentage of deficiency (12)
		(3)	(4)	(5)	(6)		(8)	(9)	(10)	(11)	
(1)	(2)	99	567	151	5	88.0	95	214	38	1	72.7
I. General	6 Appearance ..	..	..	..	..	..	..	..	..	..	..
II. Eyes—											
(a) Conjunctiva	7 Xerosis ..	..	..	..	..	..	..	..	..	..	..
	8 Pigmentation ..	546	167	63	46	33.6	277	44	14	13	20.4
	9 Discharge ..	..	591	62	4	28.1	286	50	10	2	17.2
(b) Cornea	10 Xerosis ..	786	30	6	..	4.4	341	7	..	..	2.0
	11 Vascularisation ..	819	2	..	1	0.4	348	..	..	..	..
(c) Lids	12 Excoriation ..	821	1	..	..	0.1	347	1	..	..	0.3
	13 Folliculosis ..	819	3	..	..	0.4	343	..	..	..	..
	14 Angular Conjunctivitis ..	822	..	..	..	..	348	..	..	..	..
(d) Functional	15 Night Blindness ..	821	1	..	..	0.1	348	..	..	..	..
	..	818	4	..	..	0.5	348	..	..	..	..
III. Mouth—											
(a) Lips	16 Condition ..	635	110	77	..	22.7	277	54	17	..	20.4
(b) Tongue	17 Colour ..	709	77	34	2	13.7	305	34	9	..	12.4
	18 Surface ..	797	13	12	..	3.0	338	9	1	..	17.5
(c) Buccal Mucosa	19 Condition ..	822	..	..	..	..	347	1	..	..	0.3
(d) Gums	20 Do. ..	816	6	..	..	0.7	346	2	..	..	0.6
(e) Teeth	21 Fluorosis ..	822	..	..	..	..	348	..	..	..	..
	22 Caries ..	751	47	24	..	8.7	316	20	12	..	9.2

ANNEXURE P—cont.

RESULTS OF NUTRITION SURVEYS CONDUCTED DURING 1960—cont.

(1)	(2)	Males 822.			Females 348.			Percentage of deficiency.	(12)
		0	1	2	3	0	1	2	3
		(3)	(4)	(5)	(6)	(8)	(9)	(10)	(11)
IV. Hair ..	23 Condition ..	811	10	1	..	1-3	340	5	3
V. Skin—									
(a) General ..	24 Appearance ..	598	203	13	8	27-3	291	51	1
	25 Elasticity ..	763	57	2	..	7-3	330	18	..
(b) Regional ..	26 Trunk ..	822	..	..	..	..	347	1	..
	27 Face ..	822	..	..	..	..	348	..	..
	28 Perineum ..	822	..	..	..	..	348	..	..
	29 Extremities ..	821	1	..	..	0-1	348	..	..
VI. Adipose tissue ..	30 Quantity ..	176	646	..	..	78-6	147	201	..
	31 Distribution ..	821	1	..	..	0-1	348	..	..
VII. Oedema ..	32 Condition ..	819	3	..	..	0-4	346	2	..
VIII. Bones ..	33 Size ..	822	..	..	..	..	348	..	..
IX. Heart ..	34 Appetite ..	822	..	..	..	..	348	..	..
X. Alimentary System ..	35 Stools ..	822	..	..	..	..	348	..	..
	36 Liver ..	822	..	..	..	..	348	..	..
	37 Spleen ..	822	..	..	..	..	348	..	..
	38 Calf Tenderness ..	822	..	..	..	..	348	..	..
XI. Nervous System ..	39 Paresthesia ..	632	..	..	..	..	348	..	..

* Grades as per key to the Nutritional Assessment Schedule.

ANNEXURE Q.

NUTRIENT ANALYSIS OF SOME VARIETIES OF FRIED OR ROASTED PULSES NUTS.

Serial number and name of the item.	Moisture.	Nutrients in grams—per 100 gms.							Remarks.
		Protein.	Fat.	Carbo-hydrate.	Fibres.	Minerals. (Ash.)	Calcium.	Phosphorus.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 Bengalgram (Roasted and salted).	12.65	19.69	4.19	60.35	—	3.32	0.198	0.181	12.15
2 (lowgram (Roasted and salted).	9.09	23.00	0.50	57.26	5.40	4.75	0.340	0.223	8.90
3 Greengram (Fried and salted).	4.70	20.30	23.25	45.58	2.50	3.67	0.095	0.348	8.92
4 Groundnuts (Roasted and salted).	6.80	24.87	39.78	20.87	4.08	3.80	0.051	0.328	0.59

ANNEXURE R.

ANALYSIS OF FOOD FISHES BY FISHERIES DEPARTMENT.

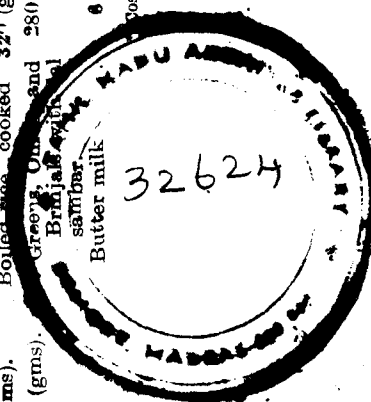
Serial number and Species. (1)	Edibility. (2)	Moisture.		Protein.		Fat.		Ash.		P. O.		Ca. O	
		PER CENT.	(3)	PER CENT.	(4)	PER CENT.	(5)	PER CENT.	(6)	PER CENT.	(7)	PER CENT.	(8)
1 Dussumieria ..	75.00	76.26	20.11	4.20	1.01	0.30	0.20						
2 Cybium ..	70.00	78.30	22.40	3.90	1.20	0.68	0.18						
3 Chirocentrus ..	70.00	78.20	21.70	1.10	1.50	0.20	0.09						
4 Serranus Miniatus ..	55.00	76.74	20.10	5.80	1.50	0.50	0.28						
5 Sardinella Sirm ..	71.04	78.03	18.30	2.10	0.55	0.03	0.07						
6 Serranus Undulosus ..	62.05	80.72	16.10	0.74	1.30	0.60	0.48						
7 Serranus Pantherinus ..	55.05	77.96	17.70	2.00	1.40	0.67	0.30						
8 Sphyræna ..	64.07	81.80	16.20	1.10	1.30	0.40	0.08						
9 Lactarius Lactarius ..	44.04	70.40	17.30	5.30	1.50	0.50	0.33						
10 Lutianus Rivulatus ..	45.00	78.90	16.20	1.10	1.20	0.39	0.12						
11 Caranx rotundus ..	50.00	75.80	18.40	1.30	1.70	0.29	0.28						
12 Leiognathus ..	60.00	77.20	16.50	2.90	1.80	0.38	0.50						
13 Caranx Malabaricus ..	67.00	76.00	15.90	1.90	1.82	0.32	0.30						
14 Lutia us Sp. ..	66.00	78.00	16.10	1.65	1.50	0.41	0.23						
15 Lates Calcarifer ..	60.00	74.90	14.80	2.80	1.20	0.32	0.30						
16 Uchis Filongata ..	75.00	70.30	19.87	8.20	1.50	0.37	0.28						

ANNEXURE S.

STUDIES OF INSTITUTIONAL DIETS --
NUTRIENT ANALYSIS OF MODEL DIET FOR HARIJAN HOSTELS (VEGETARIAN).

Particulars.	Total dry weight in grams (2)	Nutrients in grams.							Remarks.
		Protein. (3)	Fat. (4)	Carbo- hydrates. (5)	Fibre. (6)	Minerals. (7)	Calcium. (8)	Phos- phorus. (9)	Iron. (Mgms.) (10)
Breakfast ..	120	12.96	4.87	38.61	3.89	9.67	0.194	0.154	26.88
Midday meal and evening snack.	245	40.30	18.69	155.56	10.78	19.67	0.774	0.671	450 1 Model diet prepared in the Nutrition laboratory.
Night meal ..	176	23.09	12.32	123.03	5.91	11.65	0.243	0.348	26.88
Total as analysed.		76.35	24.88	367.26	20.58	40.99	1.211	1.173	952 2 Total cost of the diet is as follows *
Values as calculated.		24.95	31.38	388.20	..	46.90	2.012	1.420	56.54 Cost of ingredients at prevailing rates .. 44 nP Other charges 6 nP 50 nP
Breakfast:--									
Ragi Koolam .. 585 (gms).									
Roasted, Bengal gram coconut and green, chillies chutney.									
Midday meal:--									
Boiled rice, cooked 320 (gms).									
Green, Onion and Brinjals with sambar.									
Butter milk 6 (oz.)									
Evening snack:--									
Roasted ground nut 45 (gms.)									
and Jaggery.									
Milk (reconstituted) 8 (oz.)									
Jaggery for milk 0.25 (oz.)									
Night meal:--									
Boiled rice cooked 382 (gms.)									
Vegetable sambar 298 (gms.)									
Butter milk 6 (oz.)									
Annas eight per day per head.									

Post of milk powder not included.



ANNE

DETAILS OF THE NATIONAL MALARIA

Serial number and name of the unit.	Areas.		Population in lakhs.	Endemic or Hypo-endemic.
	Districts.	Taluks.		
(1)	(2)	(3)	(4)	(5)
1 Bhavanisagar ..	Nilgiris Coimbatore	All taluks—Avanashi, Gobichettipalayam and Bhavani.	14.2	Endemic and Hypo-endemic.
2 Tiruppur ...	Coimbatore	Palladam, Dharapuram and Erode.	10.5	Do.
3 Pollachi ..	Do.	Pollachi and Udumalpet.	13.2	Do.
4 Thiruchengode ..	Salem	Tiruchengode and Namakkal.	8.7	Do.
5 Krishnagiri ..	Do.	Hosur and Krishnagiri.	7.0	Do.
6 Dharmapuri ..	Do.	Dharmapuri and Omalur.	7.1	Do.
7 Salem ..	Do.	Salem, Yercaud and Harur.	8.3	Do.
8 Attur ..	Do.	Attur, Rasipuram and Sendamangalam firka of Namakkal.	..	Do.
9 Tirupattur ..	North Arcot	Tirupattur, Gudiyatam and Vellore.	10.7	Do.
10 Polur ..	Do.	Chengam, Polur and Tiruvannamalai.	10.1	Do.
11 Ranipet ..	Do.	Ranipet, Arkonam, Cheyyur and Wandiwash.	12.0	Hypo-endemic.
12 Saidapet ..	Chingleput Madras city	Ponneri, Tiruvallore, Saidapet and Sriperumbudur and the periphery of Madras City.	18.0	Endemic and Hypo-endemic.
13 Madurantakam ..	Chingleput	Chingleput, Madurantakam and Kancheepuram.	11.0	Hypo-endemic.
	South Arcot	Tindivanam.		
14 Cuddalore ..	South Arcot	Villupuram and Cuddalore and portions of Vridhachalam and Chidambaram.	12.2	Do.
15 Kallakurichi ..	Do.	Kallakurichi, Tirukoilur and a portion of Vridhachalam.	10.0	Endemic and Hypo-endemic.
16 Mayuram ..	Thanjavur South Arcot	Sirkali, Mayuram, Nannilam and Nagapattinam, a portion of Chidambaram and a portion of Chidambaram.	11.4	Hypo-endemic.
17 Thanjavur ..	Thanjavur	Kumbakonam, Papanasam and Thanjavur and portions of Mannargudi and Orathanad.	12.2	Do.
18 Pattukkottai ..	Do.	Pattukkottai, Arantangi and Thiruthurai-poondi.	10.1	Do.

XURE T-1.

ERADICATION PROGRAMME.

If endemic, Vector.	Urban areas.	Number of structures sprayed.	Malaria metric data (rate per cent).					
			Splee		Parasite.		Morbidity.	
			1959.	1960.	1959.	1960.	1959.	1960.
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
A. fluviatilis and A. culicifacies.		234,057	0.4	0.1	0.01	Nil.	0.6	0.6
A. culicifacies ..	A. stephensi.	335,750	0.02	Nil.	0.05	Nil.	0.7	0.6
A. fluviatilis and A. culicifacies.		276,848	0.1	Nil.	0.1	Nil.	0.6	0.3
A. culicifacies ..		286,387	0.1	Nil.	0.02	Nil.	3.8	1.3
A. fluviatilis and A. culicifacies.		194,690	1.3	0.2	1.1	Nil.	2.7	1.3
Do. ..		244,673	1.0	0.4	0.1	0.1	2.9	0.7
Do. ..	A. stephensi.	226,986	0.02	Nil.	Nil.	Nil.	3.6	1.3
Do. ..		194,849	1.0	0.2	0.4	Nil.	1.5	0.7
Do. ..		282,448	0.4	Nil.	0.9	Nil.	1.5	1.1
Do. ..		305,151	0.2	0.04	0.2	0.04	0.5	0.8
.. ..		348,884	Nil.	Nil.	Nil.	Nil.	0.8	0.2
A. culicifacies ..		397,030	Nil.	Nil.	Nil.	Nil.	0.02	0.1
....		332,888	Nil.	Nil.	Nil.	Nil.	0.1	0.3
....		308,466	Nil.	Nil.	Nil.	Nil.	0.1	0.3
fluviatilis ..		304,252	0.1	0.1	Nil.	Nil.	0.1	0.01
....		247,110	0.02	0.02	Nil.	Nil.	1.7	0.3
....		184,740	Nil.	Nil.	Nil.	Nil.	0.6	0.8
....		272,643	Nil.	Nil.	Nil.	Nil.	0.9	0.2

ANNE

DETAILS OF THE NATIONAL MALARIA

Serial number and the unit.	Areas.		Population in lakhs.	Endemic or Hypo-endemic.
	Districts.	Taluks.		
(1)	(2)	(3)	(4)	(5)
19 Tiruchirappalli ..	Tiruchirappalli, South Arcot.	Tiruchirappalli, Ialgudi Udayarpalayam a portion of Vriddhachalam.	13.0	Hypo-endemic.
20 Musiri ..	Tiruchirappalli, South Arcot.	Karur, Musiri and Perambalur a portion of Vriddhachalam.	11.0	Endemic and Hypo-endemic.
21 Pudukkottai ..	Tiruchirappalli.	Kulithalai, Kulathur, Alangudi and Thirumayam.	9.6	Do.
22 Dindigul ..	Madurai ..	Palni, Dindigul and Melur.	11.3	Do.
23 Batlagundu ..	Do. ..	Nilakkottai, Kodaikanal and Periyakulam.	10.0	Do.
24 Tirumangalam ..	Madurai .. Ramanathapuram.	Tirumangalam and Madurai and Srivilliputtur.	14.3	Do.
25 Sivaganga ..	Ramanathapuram.	Tirupattur, Tiruvadanai, Sivaganga, Paramagudi and Ramanathapuram.	11.0	Do.
26 Aruppukottai ..	Ramanathapuram, Tirunelveli ..	Sattur, Aruppukottai and Mudukulathur, Koilpatti.	10.8	Hypo-endemic.
27 Palayamkottai ..	Tirunelveli ..	Tirunelveli, Srivaikuntam, Tiruchendur and Nanguneri.	12.7	Endemic and Hypo-endemic.
28 Tenkasi ..	Do. ..	Sankaranayinarkoil, Tenkasi, Ambasamudram and Shencottah.	10.5	Do.
29 Nagercoil.	Kanyakumari ..	All taluks ..	9.5	Do.
30 Madras ..	Madras City ..	....	13.0	Do.

XURE T-1—cont.

ERADICATION PROGRAMME—cont.

If endemic, Vector.	Urban areas.	Number of structures sprayed.	Malaria metric data (rate per cent).					
			Spleen.		Parasite.		Morbidity.	
			1959.	1960.	1959.	1960.	1959.	1960.
(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
....		299,154	Nil.	Nil.	Nil.	Nil.	0.5	0.3
A. fluviatilis ..		351,061	0.3	0.1	0.04	Nil.	1.7	0.3
A. culicifacies ..		312,278	0.02	0.02	Nil.	Nil.	0.3	0.03
A. culicifacies and A. fluviatilis.		343,320	0.04	0.01	0.01	Nil.	0.3	0.3
Do.		281,915	0.05	0.02	0.1	Nil.	0.6	0.1
Do.		314,143	0.6	Nil.	Nil.	Nil.	0.1	0.01
A. culicifacies ..		308,571	0.05	0.02	0.2	Nil.	0.7	0.2
....		355,743	Nil.	Nil.	Nil.	Nil.	0.1	0.3
			Less than					
A. stephensi and A. culicifacies.		322,874	0.01	Nil.	Nil.	Nil.	0.7	0.2
A. fluviatilis and A. culicifacies.		284,783	Nil.	Nil.	Nil.	Nil.	0.2	0.1
A. fluviatilis A. culicifacies and A. stephensi.		287,678	Nil.	Nil.	Nil.	Nil.	0.2	0.1
A. stephensi ..		..	1.3	1.1	0.1	Nil.	0.1	0.1
			Less than					

ANNEXURE T-2.

NUMBER OF FEVER CASES DETECTED AND THE NUMBER TREATED DURING
MALARIA SURVEILLANCE OPERATION IN 1960 UNDER NATIONAL
MALARIA ERADICATION PROGRAMME.

Name of Unit.	Number of fever cases detected.	Number of fever cases treated.
(1)	(2)	(3)
1 Bhavanisagar	10,044	8,556
2 Pollachi	12,848	12,500
3 Tiruppur	7,922	7,922
4 Tiruchengode	10,342	10,264
5 Krishnagiri	8,349	8,342
6 Dharmapuri	24,703	23,991
7 Salem	27,636	27,334
8 Attur	8,568	8,568
9 Tiruppattur	15,803	14,570
10 Polur	21,560	15,644
11 Ranipet	17,047	8,094
12 Saidapet	9,992	9,756
13 Madurantakam	6,192	2,747
14 Kallakurichi	19,037	18,983
15 Cuddalore	7,655	5,807
16 Thanjavur	23,540	9,388
17 Mayuram	19,701	8,671
18 Pattukkottai	15,390	8,890
19 Tiruchirappalli	11,995	10,888
20 Musiri	16,587	13,631
21 Pudukkottai	16,241	10,161
22 Dindigul	18,915	12,860
23 Batlagundu	16,296	12,601
24 Thirumangalam	24,136	19,311
25 Sivaganga	20,285	18,728
26 Aruppukkottai	12,114	10,309
27 Palayamkottai	14,834	14,476
28 Tenkasi	15,288	15,136
29 Nagarkoil	23,614	14,416
30 Madras Corporation	18,839	14,024

ANNEXURE U.

STRENGTH OF OFFICERS OF THE PUBLIC HEALTH DEPARTMENT
AS ON 31ST DECEMBER 1960.

	Number of posts.
Director of Public Health	1
State Malaria Officer	1
Assistant Directors of Public Health (including the Professors of Social and Preventive Medicine, Madurai and Madras).	9
Officer-in-charge, Orientation Training Centre, Poonamallee	1
Special Supervisory Unit Officers	3
Health Officers	116*
Chief Entomologist	1
Senior Entomologists	4
(includes one post in the Madurai Medical College and Madras Medical College)	
Unit Officers in the grade of Senior Entomologists	18
Statistician	1
Malaria Engineer	1
(kept in abeyance).	
Public Health Assistant Engineer, Health Unit, Poonamallee	1
Public Health Assistant Engineer, Orientation Training Centre, Poonamallee	1
Public Health Sanitary Engineer, Research-cum-Action Project, Poonamallee	1
Medical Officer (Maternal and Child Health), Government Training School for Health Visitors.	1
Medical Officer (Maternal and Child Health), Health Unit, Poonamallee	1
Publicity Officer (Non-Medical)	2
Research Analyst	1
Research Aide	1
Manager	1
Gazetted Assistant (Non-Technical), National Malaria Eradication Programme	1
Regional Transport Officer	1
Accounts Officer	1
Medical Officer (Maternal and Child Health), Orientation Training Centre, Poonamallee	1
Government Analyst	1
Deputy Government Analyst	1
Senior Assistants to Government Analyst	8
Chief Water Analyst	1
Assistant Water Analysts	6
Medical Biologist	1

* These include two posts of Regional Malariologists, one post of Health Officer to assist the State Malaria Officer, eight posts of Supervisory Unit Officers, National Malaria Eradication Programme, eight posts of Health Officers in National Filaria Control Unit, one post of Nutrition Officer, one post of Health Education Officer, two posts of Supervising Public Health Officers, B.C.G. Vaccination Campaign, one post of Assistant-in-charge, Orientation Training Centre, Poonamallee, four posts of Assistant Professors of Social and Preventive Medicine in the Medical Colleges, one post of Research Health Officer, one post of Health Officer, Health Unit, Poonamallee, one post of Health Officer, Rameswaram Panchayat Board, one post of Health Officer, Government Leprosy Treatment and Study Centre, Tirukoilur, one post of Health Educator, Poonamallee, one post of Health Officer, Smallpox Eradication Scheme, two posts of Health Educators, Research-cum-Action Project, Thanjavur and Madurai, one post of Special Officer for UNICEF Supplies, one post of District Health Officer, Kanyakumari and three posts of Assistant Municipal Health Officers.

ANNEXURE V.

STRENGTH OF PUBLIC HEALTH SUBORDINATE SERVICE AS
ON 31ST DECEMBER 1960.

Category. (1)	Permanent posts. (2)	Temporary posts. (3)	Total strength. (4)
1 (a) Health Inspectors—			
Ranges in districts	127	..	127
Hydro-Electric Scheme	2	5	7
Regional Malaria Organization	2	..	2
Central Nutrition Bureau	2	2	4
Health Unit, Poonamallee	4	1	5
Public Health Scheme	9	..	9
Leave and Epidemic Reserve	58	..	58
Research Schemes	..	5	5
Research-cum-Action, Project	..	3	3
Orientation Training Centre, Poonamallee	..	1	1
B.C.G. Vaccination Campaign	..	61	61
National Malaria Eradication Programme	..	223	223
National Filaria Control Programme	..	24	24
Guineaworm Eradication Programme	..	19	19
Anti-plague work	..	12	12
Mobile Epidemic Unit	..	2	2
Yaws Surveillance Unit	..	3	3
Water Analysis Scheme, King Institute	..	1	1
Primary Health Centres (National Extension Service, Community Development, Public Works Scheme).	..	131	131
Cholera Epidemic Reserve	..	32	32
	204	525	729
(b) Health Inspectors under other Departments—			
T.B. Sanatorium, Tambaram	1	..	1
Government Leprosy Subsidiary Centres	..	29	29
Rural Extension Training Centre	..	7	7
National Water-supply and Sanitation Scheme	..	18	18
T.B. Sanatorium, L.A. Committee	..	1	1
Mobile Medical Unit	..	8	8
Government Chinchona Plantations	..	1	1
	1	64	65
Grand total	205	589	794
2 Malaria Programme—			
Entomological Assistants	6	34	40
Laboratory Technician	1	..	1
Laboratory Assistants	7	76	83
Field Assistants	18	192	208

ANNEXURE V—cont.

STRENGTH OF PUBLIC HEALTH SUBORDINATE SERVICE AS
ON 31ST DECEMBER 1960—cont.

Category. (1)	Permanent posts. (2)	Temporary posts. (3)	Total strength. (4)
3 Health Education—			
Sub-Editor	..	1	1
Home Science Assistant	..	1	1
Silk Screen Technician	..	1	1
Duplicating Technician	..	1	1
Technician	1	..	1
Artist and Photographer	1	..	1
Cinema Operators	..	5	5
Craftsman	..	1	1
Driver	..	1	1
Social worker	..	1	1
4 Nutrition—			
Chemical Assistant	1	..	1
Laboratory Attendants	2	..	2
Laboratory Assistants	3	..	3
Technician	..	1	1
5 Transport—			
Store Superintendent	..	1	1
Store-keepers	..	2	2
Store-purchasing Clerk	..	1	1
Electricians	..	4	4
Mechanics	..	8	8
Foremen	..	4	4
Cleaners	..	12	12
6 Vital Statistics—			
Statistical Assistants	1	2	3
Draftsman	1	..	1
7 Research—			
Laboratory Attendant	1	..	1
Trained Attenders	..	2	2
8 Plague—			
Plague Overseers	..	4	4
Laboratory Attender	..	1	1
9 Health Unit, Poonamallee—			
Health Educator	..	1	1
Laboratory Technician	..	1	1
Pharmacists	..	2	2
Artist	..	1	1
Fitters	2	..	2
Vaccinators	4	..	4
Health Assistants	..	2	2

ANNEXURE V—cont.

STRENGTH OF PUBLIC HEALTH SUBORDINATE SERVICE AS
ON 31ST DECEMBER 1960—cont.

Category.	Permanent posts.	Temporary posts.	Total strength.
(1)	(2)	(3)	(4)
10 Maternal and Child Health—			
Resident Matron	1	..	1
Public Health Nurses	..	4	4
Health Visitors	4	142	146
Maternity Assistants	18	906	924
Drivers	1	1	2
11 Government Analyst Department—			
Junior Analysts to Government Analyst ..	12	..	12
Technical Assistant	1	..	1
Laboratory Attendants, Grade I	4	..	4
Laboratory Attendants, Grade II	3	..	3
12 Water Analysts' Department—			
Junior Water Analysts	5	2	7
Laboratory Assistant	..	1	1
Sample Takers	5	1	6
Health Inspector	..	1	1
Technical Assistants	..	3	3
Technicians	2	2	4
Algae Collector	1	..	1
Laboratory Attendants, Grade I	4	3	7
Laboratory Attendants, Grade II	3	4	7
13 Miscellaneous—			
Librarian	..	1	1
* Sanitary Inspectors	8	3	9
* Health Assistants	47	19	66
* Field Assistants	6	..	6
Mason (Research-cum-Action Project)	..	1	1
Driver-cum-Mechanic (B.C.G.)	..	2	2
Pump Operator (Orientation Training Centre) ..	..	1	1
Carpenter (Research-cum-Action Project) ..	..	1	1
Observers (Research-cum-Action Project) ..	..	2	2
Packer-cum-Carpenter (UNICEF)	..	1	1
Drivers	5	212	217
Field Assistants (Guineaworm Eradication Programme).	..	55	55
Vaccinators (Smallpox Eradication Programme).	..	140	140
Health Assistants (Yaws)	..	3	3

* Transferred from the Travancore-Cochin State.

ANNEXURE W.

STRENGTH OF PUBLIC HEALTH STAFF EMPLOYED UNDER LOCAL BODIES AS
ON 31ST DECEMBER 1960.

Serial number and designation of the posts.	Municipalities.	District Boards.	Township Committees.	Corporation of Madras.	Total.
(1)	(2)	(3)	(4)	(5)	(6)
1 Lady Superintendents-in-charge (Maternity and Child Welfare).	1	Nil.	Nil.	1	2
2 Medical Officers (Maternity and Child Health), Grade I.	24	4	Nil.	37	65
2 Medical Officers (Maternity and Child Health), Grade II.	15	8	Nil.	Nil.	23
4 Health Visitors	52	13	1	101	167
5 Resident Matrons	13	2	Nil.	1	16
6 Maternity Assistants	439	244	7	244	934
7 Compounders	7	Nil.	Nil.	109	116
8 Ayahs	312	225	8	87	632
9 Sanitary Inspectors (Selection grade)	15	Nil.	Nil.	Nil.	15
10 Sanitary Inspectors	287	3	5	68	363
11 Health Assistants	250	372	2	116	740
12 Field Assistants	61	Nil.	2	67	130
13 Nursing Orderlies	6	Nil.	Nil.	134	140

ANNEXURE X.

STATEMENT SHOWING WORK DONE UNDER GUINEAWORM ERADICATION PROGRAMME IN 1960.

Serial number and Units.	Villages surveyed.		Village infected.		Infected villages.			Number of water sources treated with chemicals.			
	Total number.	Number.	Percentage to total.	Total Population.	Number of cases detected.	Prevalence rate per cent.	Number of villages taken up for treatment.	Tanks.	Step wells.	Other open sources.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1 Villupuram ..	1,504	254	16.5	1,110,781	2,866	1.0	383	222	219	840	
2 Tirukoyilur ..	877	296	33.8	975,357	2,169	0.9	288	235	14	239	
3 Polur ..	1,510	211	13.3	944,712	1,817	0.1	233	140	56	70	
4 Tiruchirappalli ..	3,240	676	20.9	966,800	3,420	0.8	209	746	915	757	
5 Madurai ..	2,192	104	4.7	1,047,658	1,010	0.1	179	326	962	841	
6 Bhavani ..	2,882	213	7.3	1,665,852	487	0.1	167	576	1,023	151	

ANNEXURE Y.

PROCEEDINGS OF THE MEETING OF THE PUBLIC HEALTH BOARD HELD AT 3 P.M. ON 23RD MAY 1960 IN ARRANMORE PALACE, OOTACAMUND.

The following members and invitees were present:—

- 1 The Hon'ble Minister for Health (President).
- 2 The Hon'ble Minister for Local Administration.
- 3 Sri S. Subramanyan, Deputy Secretary to Government, Education and Public Health Department.
- 4 Sri T. Purushotham.
- 5 Sri N. Mahalingam, M.L.A.
- 6 Sri T. Muthukannappan, M.L.C.
- 7 The Director of Medical Services.
- 8 The Sanitary Engineer to Government.
- 9 The Director of Public Health (Secretary).

The Hon'ble Minister for Health Presided.

The proceedings of the extraordinary meeting of the Public Health Board held on 24th February 1960 were considered. The question of appointment of Special Food Inspectors for intensive drive against food adulteration was raised. The Director of Public Health said that the proposals were under consideration of the Government. The Deputy Secretary to Government stated that the question as to whether the Special Food Inspectors were empowered to take measures under the present statutory provisions was being examined and that amendment of the rules framed under the Food Adulteration Act by the Central Government might be necessary. It was urged that early action should be taken to appoint the Special Food Inspectors. The President requested the Deputy Secretary to see that early action in the matter was taken.

Sri T. Purushotham wanted to know whether Personal Assistants to Commissioners of III grade municipalities were appointed. The Director of Public Health replied that necessary proposals submitted to the Government were under consideration. In this connection the question of solving the problem of dearth of Health Officers was raised.

Sri T. Purushotham stated that he had already given two proposals:—

(1) Certain proportion of seats in the Medical Colleges should be earmarked for candidates who undertake to serve the Public Health Department after graduation, and

(2) to start a college for Health Officers who will be taught public health subjects after pre-clinical course. These suggestions were already considered by the Board in previous meetings and were not acceptable. The Director of Medical Services said that it would take 7 to 8 years before the proposals, if implemented, would solve the problem. He said that higher scale of pay should be offered to medical graduates to attract them to the Public Health Department. Sri N. Mahalingam suggested that graduates in Science may be recruited and given training in Public Health work for two to three years and posted in place of health officers. The Director of Medical Services stated that such candidates would be better than the present Sanitary Inspectors who were promoted as Personal Assistants to the District Health Officers. The President stated that the Sanitary Inspectors had practical experience in Public Health field and would therefore be able to assist the Health Officers. The Minister for Local Administration wished to know whether the Sanitary Inspectors with more intensive training could not be appointed in place of Health Officers. The Director of Public Health replied that it was not possible, as medical knowledge

ANNEXURE Y—cont.

was necessary to discharge the duties of Health Officers. Sri N. Mahalingam stated that in view of the creation of many panchayat unions more health officials might be required and as public health workers with medical qualification might not be available immediately, his suggestion might be explored. It was decided that the suggestion that graduates in Science be recruited and trained for two or three years in public health work might be examined.

"The question of dearth of Municipal Engineers was then discussed. The Sanitary Engineer to Government stated that under the re-organised system there were three grades of Municipal Engineers. He stated that Engineering Graduates generally preferred employment in Central Government Services and State Services other than Municipal Engineering Services although the scales of pay of the various categories in Municipal Engineering Services were identical to those in other State Services. He pointed out that this was due to the fact that service conditions were better in Public Works and other Departments than in Municipal Engineering Services. He therefore suggested that the Municipal Engineering Services might be merged with the other Engineering Services. The Board recommended that the merging of the Municipal Engineering Service with the other services might be considered."

Sri T. Purushotham raised the question of integration of preventive and curative branches at district level, as suggested at the last meeting of the Public Health Board. The Director of Medical Services stated that there were only very few primary health centres in West Bengal and that the integration of the preventive and curative departments in that State cannot be said to be successful. Sri T. Purushotham said that as far as he could see people did not derive full benefit from the Primary Health Centres. The President said that there were some practical difficulties at present in integrating the preventive and curative sides and that it has to be adopted in slow stages. Sri N. Mahalingam stated that in these days of specialization of all fields, the two departments should be separate. It was suggested that the question might be examined by a sub-committee. No decision was however finally taken.

The proceedings of the previous meeting were then confirmed.

Item (2).—Nuisance caused to the people of Avadi Panchayat, Chingleput district on account of the working of the fertiliser factory of Messrs. Shaw Wallace and Company.—It was suggested that many industries were being established and that the general question of controlling such industries might be taken up. In regard to nuisance caused by the fertiliser factory at Avadi, the Board agreed with the note of the Director of Public Health and resolved that the first alternative for mitigating the nuisance complained of might be enforced, namely, that the effluent from the factory should always be given a preliminary treatment and subjected to solar evaporation for the elimination of salts in specially constructed shallow ponds with the bottoms and sides made impervious to prevent any percolation or seepage into the surrounding soil and that bones should be stored in under-ground godowns of sufficient capacity with impervious flooring and walls and rendered air-tight.

Item (3).—That a special committee be constituted to study the public health conditions in the State for suggesting improvements therein and for submitting proposals to amend the Madras Public Health Act for more efficient Public Health Administration.—Sri T. Purushotham explained that the All-India Committee referred to in the note of the Director of Public Health would deal with wider questions and that specific questions like control of Malaria, smallpox, evaluation of health programmes, etc., would not be dealt with. The president pointed out that in this connection it was proposed to amend the Madras Public Health Act. He stated that the question of amending the Act was under the consideration of Government and that the Board might examine the question of studying

ANNEXURE Y—cont.

Public Health conditions after proposals for amending the Act are finalised and after the report of the Dr. Mudaliar Committee was available. This was agreed to and it was resolved that the question might be considered after the proposals for amending the Madras Public Health Act were finalised.

Item (4).—Review of small-pox situation in Madras City.—The President said that small-pox situation in the City and the State as well might be discussed. Sri T. Purushotham pointed out that representatives of the Corporation were not invited as decided by the Board in the previous meeting. The Minister for Local Administration stated that when all the particulars on the question were available there was no need to invite the officials of the Corporation and that it was also not regular to bring them outside their jurisdiction. The President also stated that there was no need for officials of the Corporation to be present for this purpose. Sri T. Purushotham stated that there were some points on which the opinion of the officials of the Corporation was necessary. He said that the 200 student-Sanitary Inspectors sent by the Director of Public Health to help the Corporation to push through the Intensive Vaccination Campaign were inefficient. The President asked him to state the basis on which his observations was made. Sri T. Purushotham replied that authorities concerned informed him so and that was why he wanted the Corporation officials to be present. The Director of Public Health stated that he had not received any report stating that the students were inefficient. He pointed out that they had fully undergone training in vaccination and that the technique of vaccination was fool-proof. He added that a few students had however applied for leave as they had to appear for Sanitary Inspector's Examination. Sri N. Mahalingam asked whether persuasive measures in the matter of implementing the proposals of Government and the Director of Public Health as recommended in the last meeting were tried, and if so what were the measures adopted. The Deputy Secretary replied that several letters were issued by Government and by the Director of Public Health to the Commissioner and the Health Officer, Corporation of Madras and that 200 student-Sanitary Inspectors were deputed to help the Corporation health staff to do intensive vaccination.

The Director of Public Health stated that small-pox situation in the City continued to be unsatisfactory. On being asked to state his suggestions to improve the conditions, he said that he had made several recommendations which were not implemented. He said that Government must empower him to take necessary measures through their own health staff of the Corporation. The President stated that they decided to examine the legal aspect of the question. The Deputy Secretary said that Government could issue directions under section 6 (2) of the Madras Public Health Act empowering the Director of Public Health to inspect, control and superintend the health measures. The Board resolved that necessary directions under section 6 (2) of the Madras Public Health Act might be issued empowering the Director of Public Health to take necessary health measures.

As regards the Madras State, the Director of Public Health pointed out that a pilot scheme for Small-pox Eradication Programme has been implemented in Chingleput district and the programme would be extended to other districts during the Third Five-Year Plan.

Item (5).—Review of the progress of Guinea worm Disease Control Programme.—The Director of Public Health explained the Guinea worm Eradication Programme launched in State since 1st December 1959. In as much as the disease was prevalent only in a few pockets in Chingleput district, it was suggested that Eradication Programme could be implemented early in that district. The President supported this and stated that the programme should be taken up immediately in Chingleput district. The report of the Director of Public Health was then recorded.

ANNEXURE Y—cont.

PROCEEDINGS OF THE MEETING OF THE STATE PUBLIC HEALTH BOARD HELD AT 11 a.m. ON MONDAY, THE 5TH DECEMBER 1960, IN THE COMMITTEE ROOM OF THE SECRETARIAT.

The following members of the Public Health Board and other invitees were present at the meeting:—

- 1 Sri M. A. Manickavelu, B.A., B.L., Minister for Revenue and Health, Madras—President.
- 2 Srimathi Lourdhammal Simon, Minister for Local Administration, Madras.
- 3 Sri K. Srinivasan, I.A.S., Secretary to Government, Education and Public Health Department, Madras.
- 4 Sri S. Krishnaswami Pillai, Secretary to the Development Commissioner (I.L.B. Ex-officio) and Deputy Secretary to Government, Rural Development and Local Administration Department, Madras.
- 5 Sri T. N. Seshan, Deputy Secretary to Government, Rural Development and Local Administration Department, Madras.
- 6 Sri S. Subrahmanyam, Deputy Secretary to Government, Education and Public Health Department, Madras.
- 7 Sri Deva Anugraham, Deputy Secretary to Government (M) Rural Development and Local Administration Department, Madras.
- 8 Dr. V. R. Thayumanaswami, Director of Medical Services, Madras.
- 9 Dr. V. Rama Iyer, Assistant Director of Public Health, Madras.
- 10 Sri T. M. Ramaswamy, Joint Inspector of Municipal Councils and Local Boards.
- 11 Sri Henry David, Superintending Engineer (Public Health) and Sanitary Engineer in-charge, Madras.
- 12 Sri C. Govindan Nair, Joint Director of Town-Planning, Madras.
- 13 Sri T. Purushotham.
- 14 Sri M. G. Shankar, M.L.A.
- 15 Sri Vidwan T. Muthukannappan, M.L.C.
- 16 Dr. B. V. Sundarababu, Health Officer, Corporation of Madras.
- 17 Sri N. Parthasarathy, Assistant Secretary to Government Education and Public Health Department, Madras.
- 18 Dr. N. Parthasarathy, Director of Public Health, Madras—Secretary.

The Honourable Minister for Health presided.

The Secretary to Government, Education and Public Health Department, Madras, suggested that item 2 of the Agenda, viz., "Town-Planning in non-municipal areas" may be taken up last and that the other items 1, 3 and 4 may be taken up first. The President, the Minister for Health agreed.

The proceedings of the ordinary meeting of the Public Health Board, held on 23rd May 1960 in Aranmore Palace, Ootacamund, were considered. The question of appointment of Personal Assistants to Municipal Commissioners in III Grade Municipalities came up for consideration. Sri T. Purushotham while observing that this subject was already discussed at the last meeting wanted to

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know whether any action was taken on this. He suggested that Senior Health Inspectors or Sanitary Inspectors could be appointed as Personal Assistant to Municipal Commissioners (Public Health). The Director of Medical Services also pointed out that at present, a number of posts of Health Officers were vacant for want of qualified men. The Director of Public Health explained that proposals for appointment of Senior Health Inspectors and Sanitary Inspectors in the ratio of 50:50 as Personal Assistants to Municipal Commissioners were under the active consideration of Government.

At this stage, a reference was made to the suggestion made during the last meeting of the Public Health Board to appoint "Science Graduates as Health Officers". The Minister for Health wanted to know what action was taken on this suggestion. The Director of Public Health said that he had sent his opinion to Government in the matter. The concerned file was given to the Health Minister who then read out for the information of the members the remarks of the Director of Public Health on the suggestion. The Director of Public Health's letter to Government indicated that the suggestion of the Public Health Board to do away with medical qualification for the future Health Officers, if implemented would be a retrograde step, that the duties of the Health Officers were such that unless they possessed medical qualification, it might not be possible for them to discharge their duties properly and that as the prevention of diseases was very closely related to the curative aspect, the Health Officer who had to carry out preventive measures to control communicable diseases should have a basis knowledge of the allied subjects such as Physiology, Entomology, Bacteriology, etc., which the medical course only provides.

Sri K. Srinivasan, Secretary to Government, Education and Public Health Department, stated that professional opinion was also not in favour of employing Science Graduates as Health Officers and that even Assistant Surgeons on the curative side were not willing to take up appointment as Health Officers.

Sri T. Purushotham stated that a separate college should be started for training doctors on the Public Health subjects with a rural bias. The Director of Medical Services, at this stage, referred to his recent circular to all Civil Assistant Surgeons calling on them to exercise their option to serve in the Public Health Department, in which case they were assured that they would be given due weightage for their services in the Medical Department and that their seniority would be protected. He said that there was no response, and that any amount of inducement had not the desired effect.

Sri T. M. Ramaswamy, Joint Inspector of Municipal Councils and Local Boards pointed out that in view of the dearth of Health Officers, Health Inspectors or Sanitary Inspectors who were seniors in service might be employed as Personal Assistant to Municipal Commissioners in III Grade Municipalities and designated as "Personal Assistants to the Commissioners (Public Health)".

The Director of Public Health told the members of the Board that he had suggested a ratio of 50:50 in filling up the posts of Personal Assistants to Commissioners in III Grade Municipalities. The Health Minister considered this proposition quite proper and reasonable. He also elicited the opinion of the members. The Secretary to Government observed that this question was under the active consideration of Government as also the question of appointment of Science Graduates as Health Officers. The members of the Board then unanimously resolved that Senior most Health Inspectors and Sanitary Inspectors be appointed as Personal Assistants to Commissioners of the III Grade Municipalities.

The question of integration of Municipal Engineering Service with that of the regular Public Works Department was then considered. It was pointed out by the Secretary to Government, Education and Public Health Department, that this question was being examined at Government level and that the Public Works Department was being consulted in the matter.

ANNEXURE Y—cont.

The nuisance caused to the people of Avadi Panchayat, Chingleput district on account of the effluent water discharged from the Fertilizer Factory of Messrs. Shaw Wallace and Company, was then considered. The Director of Public Health said that Messrs. Shaw Wallace and Company had now agreed to remove the entire effluent water from their factory premises to a village three miles away by means of lorries and thus eliminate the nuisance. Sri T. Purushotham observed that only one lorry was at present being used to remove the effluent water, that this arrangement was not satisfactory and that it should be done as often as was necessary by more number of lorries.

As regards the storage of bones, the Director of Public Health said that the company had agreed to clear them by the end of this month, viz., December 1960 and based on this assurance of the firm, the District Health Officer, Chingleput, has also been directed to withdraw the prosecution of the firm by the Government.

Sri T. Purushotham desired that this nuisance from the factory is thoroughly eliminated within the shortest possible time. He desired that the Director of Public Health and Sanitary Engineer to Government should take immediate steps to put down the nuisance from effluent water stagnation, many cattle have died and that the problem was also serious. He further desired that periodical inspections were necessary and that before granting licences to new factories, strict conditions should be imposed. The Secretary to Government, Education and Public Health Department said that this could be done.

Finally, the Board resolved that investigations of the nuisance caused by the effluent water discharged from the Fertilizer Factory of Messrs. Shaw Wallace and Company, be conducted by the Director of Public Health and Sanitary Engineer to Government and urgent action taken to eliminate the nuisance altogether.

The question of small-pox situation in the City came in next for discussion. Sri T. Purushotham desired to know whether immediate action would be taken to prevent the spread of small-pox infection in the City of Madras. The Health Minister assured him of early action in the matter. The Director of Public Health then explained to the members that under section 6 (2) of the Madras Public Health Act, the Government have empowered him to inspect, control and superintend the operations of the Madras Corporation in the field of small-pox control. The Director of Public Health also said that a scheme for eradication of small-pox in the City costing a lakh of rupees has been prepared by him in consultation with the Health Officer, Corporation of Madras, and that the same would shortly be submitted to Government for orders. The Health Officer, Corporation of Madras, at this stage requested that the Government might be pleased to grant an advance of rupees one lakh for implementing the scheme immediately since the cost of the scheme is fairly large. The Health Officer, Corporation of Madras, also explained that the proposal has to pass through the Corporation and Standing Committee on Health as the expenditure involved is huge and consequently there would be delay in implementation. The Health Minister agreed on the point that the Corporation had not adequate resources to meet the expenditure. The Minister further wanted to know as to who should bear the cost of the scheme. The Secretary to Government, Education and Public Health Department, said that the entire expenditure on the scheme was the liability of the Corporation and that the measures to be executed had to be settled by the Government and Corporation of Madras. He also said that a certain concession can be given in the matter of grant of advance to the Corporation for implementing the scheme. The Director of Medical Services wanted to know whether there was sufficient man-power for implementation of the scheme. The Director of Public Health said there was and some more would be trained very soon. To query by the Minister for Health whether

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the scheme would be completed in four months' time, the Director of Public Health said that it would be done. The Health Officer, Corporation, also said that this can be done provided facilities are available.

The Board then resolved that the scheme of Eradication of Smallpox in the City of Madras drawn up by the Director of Public Health be implemented immediately and the Government be pleased to sanction an advance of rupees one lakh for the purpose in the first instance, in view of the urgency of the scheme, as a special case and later on be re-imbursed from the Corporation relaxing the rules if necessary.

The proceedings of the meetings of the Public Health Board held on 23rd May 1960 were then confirmed.

Item 3 of the Agenda: Review of the work done by Research-cum-Action Project and the Pilot Project for latrine construction.—The progress report on the working of the Research-cum-Action Project was already circulated. The Secretary to Government, Education and Public Health Department, at the outset, pointed out that the Research-cum-Action Project has been set up only to set an example for the rural people to use sanitary type of latrines. The question of granting a subsidy for latrine construction to technical workers figured in the discussion. The Director of Public Health said that on account of the poor financial condition of the people in rural parts, it was quite necessary to subsidise in the matter of construction of latrines. Sri T. Purushotham said that no special allowance need be given to technical workers by way of subsidy.

The Board resolved that a uniform subsidy of Rs. 25 be granted towards the construction of latrines during the Third Five-Year Plan.

In connection with the formation of an advisory committee to help and render support to the activities of the project, the Secretary, Education and Public Health Department, said that the recently constituted Health Education Council can be made to serve as an Advisory Committee for the Research-cum-Action Project.

The Board resolved that the Government be requested to issue an order to the effect that the Health Education Council serves as an advisory committee to the Research-cum-Action Project.

Item 4 of the Agenda: Report on progress made in the Guinea-worm Eradication Programme during the period, May to October 1960.—The Director of Public Health said that a special report on the progress of Guinea-worm Control and Eradication Programme was sent to Government pertaining to Chingleput district. Sri T. Purushotham pointed out that mere report would not solve the problem and that a regular follow-up should be made. The Director of Public Health then said that a comprehensive re-survey was carried out in Chingleput district. Sri T. Muthukannappan said that there are more number of villages now where the disease is prevalent and he wanted that survey should be followed by control. The Assistant Director of Public Health said necessary provision has been made in the Third Five-Year Plan for eradication of Guinea-worm diseases in the State. The Secretary, Education and Public Health Department, said that finance will not be in the way of control measures. The Director of Public Health then explained that survey and control work always go together and that the entire State would be covered soon.

The report was then recorded.

Item 2 of the Agenda: The Town-Planning Schemes for non-municipal areas.—The Joint Director of Town-Planning explained to the members of the Board in detail about the subject. He narrated the impressions he gained at the conferences held at Hyderabad last year and at Bangalore during this year on "Town

ANNEXURE Y—cont.

and Country Planning" which the Health Minister also attended. A note prepared by the Joint Director was also given to the Minister, the Director of Public Health and the Secretary to Government, Education and Public Health Department. He stressed the need for increasing the allotment under "Town Planning Schemes". He pleaded that the Town Planning Department should always function as a separate organisation. With regard to the Rural Housing Schemes, he desired that the Town Planning Department should be consulted.

He pointed out that the Rural Housing Scheme formulated by the Government of India has not been found to be very successful. He said that the Town Planning Department is not consulted in the preparation of Master Plan for villages.

Sri M. G. Shankar said that buildings are put up by the Highways Department anywhere and everywhere. He desired that while working out Village Housing Schemes, the Town Planning Department should always be consulted. Sri T. Purushotham also agreed with this view. He further said that the Town Planning Department should function as a separate department.

The Board resolved that the question of merger of the Town Planning Department with the Public Works Department should be examined in greater detail.

It was also resolved that in the matter of the Village Housing Scheme, the Director of Town-Planning should be consulted irrespective of the fact whether the Village Housing Schemes are entrusted to the Director of Town-Planning or not.

The Joint Inspector of Local Boards agreed with this view.

It was further resolved that in the matter of framing new key schemes for villages, the Town Planning Department should be consulted.

In regard to the question of laying down certain principles on "Town-Planning Schemes" as per the suggestion of the Minister for Health, it was decided that the question may be taken up during the next meeting of the Board.

The Minister for Health thanked all those present for having taken part in the deliberations and then dissolved the meeting.

PROCEEDINGS OF THE EXTRAORDINARY MEETING OF THE PUBLIC HEALTH BOARD
HELD ON 24TH FEBRUARY 1960 AT POONAMALLEE.

The following members of the Public Health Board were present:—

The Hon'ble Minister for Health (President).

The Hon'ble Minister for Local Administration.

Sri M. G. Shankar, M.L.A.

Sri T. Purushotham, M.L.O.

The Sanitary Engineer to Government.

The Director of Public Health (Secretary).

The Secretary to Government and the Deputy Secretary to Government, Education and Public Health Department, the Deputy Secretary, Rural Development and Local Administration Department, and Miss Dorothy A. Huskey, Public Health Education Adviser (TCM) Public Health Department, were also present by special invitation. The Hon'ble Minister for Health presided.

As resolved at the meeting of the Public Health Board held on 19th November 1959, the members of the Public Health Board visited the Research-cum-Action Project and the Orientation Training Centre, Poonamallee, before the meeting commenced.

ANNEXURE Y—cont.

The Secretary to Government explained the action taken by the Government on the resolutions passed at the meeting of the Public Health Board held on 19th November 1959.

Regarding the proposals of the Director of Public Health for appointment of Special Food Inspectors for intensive drive against food adulteration, further particulars have been called for from him.

In respect of proposals to appoint Personal Assistants to Commissioners of III Class Municipalities, certain representations from members of the Legislature are being examined in consultation with the Director of Public Health and the Inspector of Municipal Councils and Local Boards, Madras.

As regards improvement of service conditions of Municipal Engineers, it was stated that the question of reorganisation of Engineering Services in the State including Municipal Engineers was under the consideration of Government.

The report of the Sub-Committee of the Public Health Board which examined the public health set-up consequent on the liquidation of District Boards was discussed at a meeting with the Development Commissioner and the concerned Heads of Departments. No conclusions were, however, arrived at. In this connection, three points had to be considered:—

(1) The extra cost involved by increased staff necessary for the new set-up, (2) training facilities for the public health staff and (3) administration. It was felt that people did not derive the fullest benefit from even the existing organisation of Primary Health Centres and that in order to ensure this, there should be integration of preventive and curative branches at the district level at least. It was pointed out in this connection that in West Bengal the integration of preventive and curative departments has been successfully working.

In respect of inclusion of lessons on health subjects in the text-books for lower classes, the remarks of the Commissioner for Government Examinations on the recommendations of the Sub-Committee of the Board have been called for.

Sri T. Purushotham stated that the activities of the Public Health Board were reviewed very briefly in a paragraph in the Annual Public Health Administration Report and suggested that a separate report giving the proceedings of the Board should be published. This was agreed to and the Board resolved that an Annual Report of the Public Health Board might be prepared and published.

The proceedings of the meeting of the Public Health Board on 19th November 1959 were then confirmed.

Item (2)—Control and supervision by the Director of Public Health over the Public Health Administration and Health personnel in the City of Madras, municipal and non-municipal areas.—The Director of Public Health stated that he was unable to get the health measures suggested by him put through in Madras City and that in the interest of safeguarding the health of the whole State it was necessary that there should be co-ordinated effort in all areas. The Secretary to Government said that the Director of Public Health had adequate powers to control public health administration in the City of Madras, could make suggestions to improve health conditions, but he was not in a position to see that his proposals were executed. He added that it was only necessary to issue directions by Government under section 6 (2) of the Madras Public Health Act. Sri T. Purushotham, M.L.C., wanted to know whether Government had power to issue such directions and that legal opinion should be sought regarding the provisions in the Madras City Municipal Act. The Minister for Local Administration said that enforcement of legal provisions in this matter would be resented by the Corporation and that in other matters also it raised strong objections recently. She said that it was not advisable at this stage to raise this question.

ANNEXURE Y— cont.

She stressed that persuasive methods should be employed to get health measures implemented. Sri T. Purushotham, M.L.C., also supported her and said that Corporation must aware of its own responsibilities and asked whether enforcement of legal provisions was at all necessary. He urged that the legal opinion in this matter should be obtained. The President agreed that legal position might be examined by way of elucidation. The Secretary to Government stated that recently he had been conferring several times with the Commissioner of the Corporation, that there was personal contact and that co-operation of the Corporation authorities was forthcoming. He stated that without resorting to enforcement of legal provisions, other methods would be tried as hitherto. He added that this question arose from the failure of the Corporation to take adequate steps for prevention and control of smallpox infection which had been persisting for over two years in the City. The Deputy Secretary, Rural Development and Local Administration Department suggested that the Commissioner, Corporation of Madras, should be invited to attend the meetings of the Public Health Board whenever public health problems in the City were discussed. This was agreed to.

The Board resolved that legal provisions need not now be resorted to for implementation of health measures by the Corporation of Madras. It was also resolved that legal opinion as to the powers of the Director of Public Health and Government on this question under the existing provisions of law should be obtained.

Item (3).—Town-Planning Schemes for non-municipal areas.—As the Joint Director of Town-Planning who was specially invited to attend the meeting and the Inspector of Municipal Councils and Local Boards could not be present, the consideration of the subject was postponed to the next meeting.

Item (4).—Amendment of Regulation 6 of the Regulations for the conduct of business of the Public Health Board.—The note of Director of Public Health was discussed. Sri M. G. Shankar, M.L.A., stated that a notice of 10 days for holding a meeting was not sufficient for moffussil members. It was resolved that no change in the regulations was necessary.

The Board resolved to hold the next meeting at Ootacamund or Kodaikanal.

APPENDICES.

APPEN

STATEMENT No. I.—Vital statistics

Births registered in districts

Serial number.	Estimated mid-year population for 1960.			Districts.	Estimated mid-year population for which birth and death returns were received.		
	Males.	Females.	Total.		Males.	Females.	Total.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	994,000	921,000	1,915,000	Madras ..	994,000	921,000	1,915,000
2	1,071,000	1,039,000	2,110,000	Chingleput ..	1,071,000	1,039,000	2,110,000
3	1,576,000	1,562,000	3,168,000	North Arcot ..	1,575,000	1,562,000	3,168,000
4	1,466,000	1,468,000	2,934,000	South Arcot ..	1,466,000	1,468,000	2,934,000
5	1,673,000	1,701,000	3,374,000	Thanjavur ..	1,673,000	1,701,000	3,374,000
6	1,630,000	1,649,000	3,270,000	Tiruchirappalli ..	1,630,000	1,649,000	3,270,000
7	1,638,000	1,643,000	3,282,000	Madurai ..	1,638,000	1,643,000	3,282,000
8	1,034,000	1,130,000	2,164,000	Ramanathapuram ..	1,034,000	1,130,000	2,164,000
9	1,317,000	1,313,000	2,710,000	Tirunelveli ..	1,317,000	1,313,000	2,710,000
10	1,923,000	1,916,000	3,844,000	Salem ..	1,928,000	1,916,000	3,844,000
11	1,801,000	1,736,000	3,587,000	Coimbatore ..	1,801,000	1,736,000	3,587,000
12	211,000	195,000	406,000	Nilgiris, The ..	211,000	195,000	406,000
13	490,000	476,000	966,000	Kanyakumari ..	490,000	476,000	966,000
	16,830,000	16,899,000	33,729,000	Total for the State ..	1,683,000	16,899,000	33,729,000
	4,534,000	4,452,000	8,986,000	Urban areas ..	4,534,000	4,452,000	8,986,000
	12,297,000	12,447,000	24,744,000	Rural areas ..	12,297,000	12,447,000	24,744,000

DIX.

of the general population.

and in the State during the year 1960.

Number of births registered (excluding still births).			Ratio of births per 1,000 of estimated mid-year population.			Average of the rates published for the previous five years (1955-59).		
Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
37,081	35,529	72,610	19.31	18.55	37.92	18.23	19.28	39.25
29,767	27,681	57,448	14.11	13.12	27.23	14.75	13.91	28.66
48,256	45,096	93,352	15.23	14.23	29.47	17.27	16.25	33.82
36,152	33,503	69,661	12.32	11.42	23.74	13.73	12.63	26.86
41,026	38,416	79,442	12.16	11.30	23.55	12.87	12.07	24.94
48,217	40,839	84,116	13.22	12.51	25.72	13.17	12.36	25.53
47,365	43,539	90,904	14.43	13.27	27.70	14.30	13.35	27.66
31,657	29,158	60,815	14.63	13.47	23.10	15.00	13.79	23.79
41,036	37,302	73,888	15.16	13.95	29.11	16.31	15.31	31.59
44,260	41,033	85,313	11.51	10.69	22.20	12.27	11.40	23.47
47,745	44,140	91,885	13.31	12.31	25.62	14.10	13.21	27.23
5,560	5,217	10,767	13.69	12.83	26.52	15.33	14.69	30.03
12,996	11,942	24,833	13.35	12.36	25.71	13.71	12.78	24.59
466,068	434,001	900,069	13.82	12.87	26.69	..	..	28.21
162,947	153,667	316,614	18.13	17.10	35.23	..	..	..
303,121	290,334	593,455	12.26	11.33	23.68	..	..	..

STATEMENT NO. I.A.—Still-births registered according to classes and sex in the Municipal Towns in the State, during the year 1960.

Serial number	Municipal towns.	Still-births										Total.
		Hindus.		Muslims.		Christians.		Other classes.		Males.	Females.	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1 Madras ..	..	993	941	112	113	39	41	..	3	1,144	1,098	2,242
2 Kancheepuram ..	..	76	69	..	1	..	..	..	..	76	70	146
3 Tiruvellore ..	..	16	13	..	..	..	..	..	..	17	13	30
4 Chingleput ..	..	83	64	..	4	3	2	..	..	86	70	156
5 Tiruvottiyur ..	..	1	2	..	1	..	..	1	1	4	4	8
6 Vellore ..	..	154	123	28	28	4	4	..	..	184	155	339
7 Tiruvannamalai ..	..	43	54	7	8	1	1	..	..	51	63	114
8 Gudiyatham ..	..	38	30	11	15	..	..	..	..	49	45	94
9 Vaniyambadi ..	..	25	18	17	17	1	..	..	..	43	35	78
10 Tirupattur ..	..	61	48	7	11	1	..	..	..	72	59	131
11 Walajpet ..	..	18	11	4	2	..	..	..	..	22	13	35
12 Ambur ..	..	13	17	10	11	1	1	..	..	24	29	53
13 Arni ..	..	67	46	2	..	..	1	..	..	69	47	116
14 Arkonam ..	..	26	12	2	..	..	1	..	1	28	14	42
15 Arcot ..	..	1	1	..	..	..	..	..	..	1	1	2
16 Ranipet ..	..	35	24	12	6	1	1	..	..	48	31	79
17 Cuddalore ..	..	66	67	4	3	3	2	..	2	73	74	147
18 Chidambaram ..	..	67	56	1	1	..	..	..	..	68	57	125
19 Villupuram ..	..	46	37	3	2	2	2	..	..	51	41	92
20 Tindivanam ..	..	18	15	1	1	1	1	..	..	20	17	37
21 Thanjavur ..	..	61	35	9	5	6	4	..	..	76	44	120
22 Kumbakonam ..	..	188	155	17	11	12	6	..	..	217	172	389
23 Nagapattinam ..	..	69	51	13	9	2	3	..	..	84	63	147
24 Myvaram ..	..	100	63	6	7	3	3	..	..	109	73	182
25 Mannargudi ..	..	93	79	5	5	3	2	..	..	101	86	187
26 Tiruvarur ..	..	22	27	1	..	..	..	..	..	23	27	50
27 Tiruchirappalli ..	..	177	167	23	28	26	33	..	..	226	218	444
28 Karur ..	..	72	68	1	3	1	..	..	..	74	71	145
29 Srirangam ..	..	66	49	2	..	2	..	..	..	70	49	119
30 Pudukkottai ..	..	112	83	4	4	2	3	..	..	118	90	208
31 Madurai ..	..	420	395	21	23	10	6	..	..	451	424	875
32 Dindigul ..	..	37	25	5	1	4	4	..	..	46	26	72
33 Bodinayakanur ..	..	15	27	1	1	..	..	..	..	16	28	44
34 Periyakulam ..	..	29	35	3	8	3	1	..	..	40	44	84
35 Palni ..	..	51	38	1	9	1	2	..	..	53	49	102

36 Kodaikanal ..	..	6	6	..	..	2	1	..	..	8	7	15	29.13
37 Gumbam ..	..	1	..	..	..	..	..	..	..	2	..	2	2.93
38 Rajapalayam ..	..	69	36	..	1	1	1	..	..	39	39	78	39.54
39 Srivilliputtur ..	..	45	34	..	2	2	1	..	..	37	37	74	49.21
40 Virudhunagar ..	..	74	60	..	2	2	1	..	..	63	63	126	48.36
41 Karaikudi ..	..	22	13	..	3	3	3	..	..	19	19	38	25.88
42 Devakottai ..	..	38	27	..	1	6	4	..	..	32	29	61	72.95
43 Sivakasi ..	..	22	16	..	..	..	..	..	..	16	16	32	41.88
44 Aruppukottai ..	..	10	13	..	..	..	..	..	..	10	13	23	13.33
45 Ramanathapuram ..	..	9	3	..	..	..	..	..	..	3	9	12	9.23
46 Tuticorin ..	..	55	44	..	4	10	9	..	..	67	57	124	28.62
47 Tirunelveli ..	..	58	43	..	4	2	2	..	..	70	69	139	41.14
48 Palayamkottai ..	..	135	146	..	15	6	12	..	..	156	173	329	97.22
49 Melapalayam ..	..	4	1	..	2	..	..	..	..	7	3	10	14.08
50 Sheicottah ..	..	25	24	..	1	1	..	..	..	27	26	53	65.51
51 Salem ..	..	281	334	..	134	43	60	..	..	425	528	953	74.44
52 Rasipuram ..	..	2	1	..	..	..	..	1	..	3	1	4	5.62
53 Coimbatore ..	..	413	312	..	17	17	9	..	..	339	797	1136	50.18
54 Erode ..	..	80	58	..	1	2	2	..	..	61	61	122	38.09
55 Tiruppur ..	..	53	62	..	7	2	1	..	..	70	70	140	37.66
56 Pollachi ..	..	74	42	..	5	5	..	..	..	79	47	126	50.18
57 Dharpuram ..	..	18	11	..	2	1	1	..	..	21	14	35	25.37
58 Udumalpet ..	..	55	37	..	4	1	1	..	..	61	41	102	63.59
59 Mettupalayam ..	..	32	36	..	1	1	..	..	..	38	38	76	41.44
60 Ghicheripalayam ..	..	6	11	..	1	1	..	..	..	8	11	19	18.79
61 Kurichi ..	..	1	1	..	1	..	..	..	..	..	2	2	4.54
62 Ootacamund ..	..	24	19	..	3	3	1	..	..	30	24	54	26.34
63 Coonoor ..	..	16	12	..	4	2	..	..	..	21	17	38	28.59
64 Nagercoil ..	..	9	5	..	5	5	4	..	..	14	10	24	6.93
65 Colachel ..	..	..	..	..	..	..	..	..	..	..	..	..	..
66 Kuzhithurai ..	..	2	5	..	..	13	..	..	..	6	13	19	53.21
67 Padmanabhapuram ..	..	1	2	..	1	..	..	..	..	1	3	4	9.37
Total ..	..	4,991	4,365	512	557	249	250	2	9	5,784	5,181	10,965	41.97

STATEMENT No. II.—Showing deaths registered in the districts in the State of Madras during the year 1960.

Serial number and districts.	Area in square miles.	Population per square mile as per 1951 census.	Number of deaths registered.			Ratio of deaths per 1,000 of estimated mid-year population.			Average of published rates for the previous five years.			Number of maternal deaths.	Maternal death rate per 1,000 births (live and still).
			Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1 Madras ..	49	28,899	17,194	16,535	33,729	17.30	17.95	17.61	19.61	20.45	20.11	119	1.59
2 Chingleput ..	3,065	639	14,161	13,294	27,455	13.22	12.79	13.01	15.63	15.50	15.57	200	3.44
3 North Arcot ..	4,674	620	23,430	22,940	46,370	14.88	14.41	14.64	15.95	15.44	15.70	240	2.53
4 South Arcot ..	4,204	661	17,981	17,254	35,235	12.27	11.75	12.01	13.00	12.42	12.71	270	3.84
5 Thanjavur ..	3,740	793	17,921	18,248	36,169	10.71	10.73	10.72	13.33	13.66	13.48	384	4.74
6 Tiruchirappalli ..	5,514	534	20,234	20,275	40,509	12.41	12.36	12.39	14.32	14.59	14.31	404	4.73
7 Madurai ..	4,910	589	19,614	19,450	39,064	11.97	11.84	11.90	12.63	12.34	12.49	322	3.49
8 Ramanathapuram ..	4,849	429	13,515	13,813	27,328	13.07	12.25	12.64	13.89	12.74	13.59	173	2.64
9 Tirunelveli ..	4,419	567	20,250	21,182	41,432	15.33	15.21	15.29	15.72	14.95	15.34	372	4.65
10 Salem ..	7,063	477	17,037	17,330	34,367	8.84	9.04	8.94	10.11	10.13	10.12	257	2.97
11 Coimbatore ..	6,013	524	17,428	17,227	34,655	9.68	9.65	9.66	11.34	11.37	11.55	283	3.03
12 Nilgiris, The ..	984	317	1,667	1,377	3,044	7.93	7.06	7.50	9.32	9.35	9.33	32	2.90
13 Kanyakumari ..	613	1,285	4,594	4,480	9,074	9.38	9.41	9.39	9.63	9.43	..	109	4.35
Total for the State ..	50,132	601	25,026	203,435	401,461	12.18	12.04	12.11	..	..	13.43	3,165	3.46
Urban areas ..	..	..	60,468	58,018	118,486	13.34	13.03	13.19	..	..	..	1,290	3.92
Rural areas ..	..	..	144,558	145,417	289,975	11.76	11.68	11.72	..	..	..	1,875	3.20

STATEMENT No. III.—Statement showing the deaths registered in the State of Madras during each month of the year 1960.

Serial number and districts inclusive of Municipal towns.	(1)	Deaths registered in each month of the year 1960.												Total.
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1 Madras ..	..	2,373	3,168	2,765	2,104	2,631	2,332	2,418	2,775	2,441	3,133	3,114	4,455	33,729
2 Chingleput ..	..	2,838	2,218	1,915	1,778	2,131	2,021	2,405	2,301	1,987	2,277	2,615	3,069	27,455
3 North Arcot ..	..	5,049	4,028	2,973	2,971	2,867	2,937	3,310	3,739	3,376	3,997	4,611	6,462	46,370
4 South Arcot ..	..	3,403	3,225	2,763	2,414	2,519	2,599	2,535	2,763	2,470	2,931	3,699	3,834	35,235
5 Thanjavur ..	..	3,518	3,284	3,175	2,728	2,751	2,620	2,558	2,782	2,792	2,898	3,748	3,415	36,169
6 Tiruchirappalli ..	..	3,438	3,145	2,793	2,385	2,859	3,055	2,967	3,254	3,219	3,478	4,157	5,074	40,509
7 Madurai ..	..	3,632	3,343	3,218	2,913	3,192	3,059	2,642	2,850	2,743	2,978	3,537	4,837	39,064
8 Ramanathapuram ..	..	2,720	2,183	2,128	2,149	2,105	2,073	1,923	1,968	1,876	2,083	2,588	3,407	27,358
9 Tirunelveli ..	..	3,810	3,524	3,185	3,249	3,099	2,904	2,838	2,882	2,716	3,161	4,213	5,751	41,432
10 Salem ..	..	2,920	2,506	2,434	2,612	2,893	2,684	2,576	2,868	2,751	2,941	3,407	3,775	34,367
11 Coimbatore ..	..	2,868	2,484	2,511	2,679	2,796	2,731	2,636	2,898	2,616	2,947	3,392	4,097	34,655
12 Nilgiris, The ..	..	190	212	252	263	270	283	300	248	222	253	300	251	3,044
13 Kanyakumari ..	..	674	648	670	618	712	835	776	775	737	773	912	914	9,074
Total for the State ..	..	37,533	33,963	30,787	29,363	30,915	30,103	29,834	32,163	30,046	33,905	40,343	49,451	401,461
Rate per 1,000 of estimated population.	..	13.14	12.71	10.78	10.62	10.82	10.89	10.46	11.26	10.87	11.87	14.59	17.31	12.11
Total for Urban areas ..	..	10,297	10,505	9,659	8,735	9,471	8,908	8,528	9,402	8,222	9,828	10,818	14,113	118,486
Rate per 1,000 of estimated population.	..	13.53	14.75	12.99	11.86	12.44	12.09	11.20	12.35	11.16	12.91	14.69	18.54	13.19
Total for Rural areas ..	..	27,236	23,458	21,123	20,628	21,444	21,195	21,356	22,761	21,824	24,077	29,525	35,338	289,975
Rate per 1,000 of estimated population.	..	13.00	11.97	10.08	10.17	10.23	10.45	10.19	10.86	10.76	11.49	14.56	16.86	11.72

STATEMENT No. IV.—Deaths registered according to ages in the State of Madras during the year 1960.

Serial number	Municipal towns and Census towns in the districts of	Not exceeding one month.						Over one month and not exceeding six months.						Over six months and not exceeding twelve months.					
		Males.			Females.			Males.			Females.			Males.			Females.		
		Under one week.	Over one week.	Total.	Under one week.	Over one week.	Total.	Under one week.	Over one week.	Total.	Under one week.	Over one week.	Total.	Under one week.	Over one week.	Total.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)					
1	Madras ..	1,255	562	1,817	993	495	1,488	3,303	1,375	1,272	2,647	1,397	1,441	2,880					
2	Chingleput ..	124	88	212	91	70	161	373	117	112	229	142	148	270					
3	North Arcot ..	333	205	538	234	144	378	916	350	291	641	321	314	657					
4	South Arcot ..	64	84	148	83	51	134	282	105	101	205	133	110	248					
5	Thanjavur ..	278	181	459	257	131	388	817	212	201	413	212	179	411					
6	Tiruchirappalli ..	240	171	415	223	104	327	742	137	111	249	174	154	328					
7	Madurai ..	519	321	840	468	263	671	1,519	394	302	696	392	387	729					
8	Emanathapuram ..	182	249	431	165	130	345	776	163	144	317	110	110	380					
9	Tirunelveli ..	365	417	782	232	291	533	1,315	311	245	556	300	241	587					
10	Salem ..	105	95	200	91	91	182	392	163	175	338	203	115	423					
11	Coimbatore ..	547	233	780	378	204	582	1,367	301	270	576	252	242	454					
12	Nagpur, The ..	78	27	105	68	28	91	191	53	23	81	41	45	89					
13	Kanyakumari ..	69	58	127	33	40	78	205	53	51	117	43	42	87					
Total for Municipal towns and Rural towns.		4,199	2,663	6,862	3,318	2,013	5,411	12,793	3,787	3,352	7,111	3,779	3,734	7,563					
Total for the State ..		7,082	13,933	20,985	5,718	11,668	16,936	37,971	10,252	9,156	19,478	12,379	12,311	25,100					
		15.20	29.33	45.03	13.18	25.73	34.91	42.03	22.0	11.1	21.56	27.53	29.41	27.95					

Serial number.	Municipal towns and census towns in the districts of.	Total under one year.				One and under five years.		Five and under ten years.		Ten and under fifteen years.		Fifteen and under twenty years.		Total
		Males		Females		Males.		Females.		Males.		Females.		
		(10) and (13).	(16)	(11) and (14).	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)		(26)
1	Madras ..	4,591	4,241	8,832	3,919	4,288	628	632	229	209	259	326	1	
2	Chingleput ..	471	421	892	372	352	82	91	54	33	61	62	2	
3	North Arcot ..	1,211	1,003	2,214	881	911	193	184	102	84	95	136	3	
4	South Arcot ..	391	345	736	295	279	76	81	40	31	33	57	4	
5	Thanjavur ..	923	768	1,691	491	542	156	126	73	61	83	105	5	
6	Tiruchirappalli ..	726	591	1,317	503	593	111	134	54	69	69	162	6	
7	Madurai ..	1,604	1,340	2,944	1,255	1,421	246	254	135	142	179	212	7	
8	Ramanathapuram ..	784	679	1,463	707	725	127	145	60	67	94	106	8	
9	Tirunelveli ..	1,413	1,157	2,570	903	1,061	217	199	106	83	94	163	9	
10	Salem ..	511	572	1,143	236	286	93	99	76	72	141	135	10	
11	Coimbatore ..	1,313	1,084	2,397	835	850	138	202	127	106	94	119	11	
12	The Nilgiris ..	185	167	352	109	119	32	27	16	9	13	6	12	
13	Kanyakumari ..	230	179	409	207	182	62	65	30	33	23	29	13	
	Total for Municipal towns and Rural towns.	14,418	12,547	26,965	10,707	11,604	2,212	2,239	1,102	999	1,238	1,558		
	Total for the State ..	44,066	38,573	82,439	47,151	42,985	7,693	7,748	3,496	3,693	4,280	5,453		
		94.55	88.42	91.59	47.15	42.98	7.69	7.75	3.50	3.70	4.28	5.45		

STATEMENT No. IV.—Deaths registered according to ages in the State of Madras during the year 1960—cont.

Serial number	Municipal towns and census towns in the district of	Twenty and under thirty years.				Thirty and under forty years.				Forty and under fifty years.				Fifty and under sixty years.				Sixty years and upwards.				Total of all ages.			
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1	Madras ..	825	975	883	817	817	1,132	765	1,453	893	3,219	3,383	17,194	10,335	1	(37)	(38)								
2	Chingleput ..	89	136	123	156	156	175	99	214	130	601	553	2,244	2,083	2										
3	North Arcot ..	270	405	317	314	314	384	256	429	291	1,110	1,035	4,529	4,529	3										
4	South Arcot ..	127	205	121	155	155	163	141	201	122	631	493	2,034	1,909	4										
5	Thanjavur ..	210	343	299	355	355	373	272	454	301	1,104	1,225	4,270	4,101	5										
6	Trichirappalli ..	241	346	243	295	295	365	243	356	294	1,025	903	3,727	3,570	6										
7	Madurai ..	402	514	394	418	418	532	313	573	333	1,339	1,354	6,335	6,339	7										
8	Ramanathapuram ..	159	212	174	213	213	250	201	307	227	853	901	3,515	3,404	8										
9	Tirunelveli ..	233	459	273	333	333	359	312	532	349	1,378	1,504	5,328	5,225	9										
10	Salem ..	239	255	243	294	294	249	229	320	338	937	830	3,110	3,130	10										
11	Coimbatore ..	275	459	301	363	363	364	251	401	253	1,152	1,033	5,050	4,729	11										
12	The Nilgiris ..	42	35	42	34	34	64	36	57	24	131	127	692	584	12										
13	Kanyakumari ..	57	97	64	98	98	115	79	143	93	443	412	1,377	1,269	13										
	Total for Municipal towns and Rural towns.	3,178	4,461	3,439	3,895	3,895	4,597	3,244	5,496	3,903	14,063	13,833	69,468	55,018											
	Total for the State	8,983	13,174	10,171	12,407	12,407	13,906	11,595	16,132	13,032	56,278	54,950	295,029	263,435											

STATEMENT No. IV.—Deaths registered according to ages in the State of Madras during the year 1960—cont.

Serial number	Districts exclusive of municipal towns and census towns.	Not exceeding one month.				Over one month and not exceeding six months.				Over six months and not exceeding twelve months.			
		Males.		Females.		Males.		Females.		Males.		Females.	
1	Chingleput	Under one week. (3)	Over one week. (4)	Under one week. (6)	Over one week. (7)	Total. (5)	Total. (8)	Total. (9) and (8).	Total. (10)	Total. (11)	Total. (12)	Total. (13)	Total. (14)
2	North Arcot	230	997	1,227	164	785	899	2,123	539	560	1,149	990	925
3	South Arcot	325	1,134	1,459	316	970	1,286	2,745	932	836	1,768	1,302	1,307
4	Thanjavur	232	783	1,015	206	612	515	1,833	630	606	1,236	1,206	1,076
5	Trichirappalli	232	1,206	1,438	189	876	1,035	2,503	677	611	1,288	821	746
6	Madurai	232	1,111	1,393	215	923	1,133	2,531	670	616	1,286	895	839
7	Ramanathapuram	240	1,219	1,458	179	925	1,104	2,562	537	310	1,077	763	771
8	Tirunelveli	208	697	905	144	543	637	1,592	343	292	632	492	490
9	Salem	397	1,473	1,875	313	1,169	1,482	3,357	659	617	1,276	823	856
10	Coimbatore	323	1,631	1,959	331	996	1,327	2,683	582	498	1,084	892	707
11	The Nilgiris	294	1,274	1,568	257	1,073	1,335	2,903	559	491	1,050	697	641
12	Kanyakumari	38	150	183	23	116	139	327	67	35	102	41	52
	Total of districts exclusive of Municipal towns and Census towns.	2,853	11,235	14,115	2,400	9,075	11,475	23,593	6,453	5,804	12,257	9,060	8,547
		9.51	37.06	46.56	8.56	32.37	40.93	43.86	21.30	20.70	27.06	20.86	30.49

STATEMENT No. IV.—Deaths registered according to ages in the State of Madras during the year 1960—cont.

Serial number	Districts exclusive of municipal towns and census towns.	Total under one year.		One and under five years.		Five and under ten years.		Ten and under fifteen years.		Fifteen and under twenty years.	
		Males		Males		Males		Males		Males	
		(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)
Serial number		Females		Total		Females		Females		Females	
		(10) and (13)	(11) and (14)								
1	Chingleput ..	2,406	2,354	5,190	2,122	2,263	425	444	226	249	322
2	North Arcot ..	3,783	3,429	7,212	4,879	5,160	824	732	295	319	310
3	South Arcot ..	2,905	2,500	5,405	3,712	3,780	629	637	212	242	289
4	Thanjavur ..	2,938	2,422	5,358	1,990	2,059	425	447	202	232	272
5	Tiruchirappalli ..	2,958	2,503	5,551	3,085	3,196	586	547	271	333	317
6	Madurai ..	2,791	2,385	5,176	2,863	2,932	517	572	221	232	364
7	Ramanathapuram ..	1,737	1,469	3,206	2,416	2,072	386	419	164	189	191
8	Tirunelveli ..	3,337	2,955	6,312	3,498	4,049	575	613	236	252	327
9	Salem ..	2,743	2,533	5,275	2,372	2,494	478	500	236	280	293
10	Coimbatore ..	2,824	2,467	5,291	1,877	2,111	436	406	253	303	338
11	The Nilgiris ..	296	226	522	186	171	30	33	18	14	22
12	Kanyakumari ..	517	464	981	444	489	130	159	60	53	66
Total of districts exclusive of Municipal towns and Census towns.		29,653	25,836	55,479	29,444	31,381	5,451	5,509	2,394	2,694	3,042
		9783	9213	509							3,900

Serial number

Districts exclusive of municipal towns and census towns.

Serial number	Districts exclusive of municipal towns and census towns.	Twenty and under thirty years.		Thirty and under forty years.		Forty and under fifty years.		Fifty and under sixty years.		Sixty years and upwards.		Total of all ages.	
		Males		Males		Males		Males		Males		Males	
		(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)
Serial number		Females		Total		Females		Females		Females		Females	
1	Chingleput ..	478	636	657	660	731	611	863	661	3,232	2,964	11,917	11,211
2	North Arcot ..	537	306	654	849	942	806	1,032	972	5,102	4,827	18,438	18,411
3	South Arcot ..	647	949	776	960	1,133	931	1,231	1,084	4,363	3,855	15,345	15,345
4	Thanjavur ..	508	994	738	1,005	955	935	1,249	1,110	4,295	4,503	13,651	14,147
5	Tiruchirappalli ..	743	1,109	745	959	1,253	1,134	1,339	1,234	5,205	5,091	16,507	16,705
6	Madurai ..	594	734	734	846	866	762	854	812	3,125	3,331	12,929	13,051
7	Ramanathapuram ..	418	593	458	529	694	635	833	737	2,693	2,309	10,000	10,379
8	Tirunelveli ..	459	310	493	714	834	755	987	879	4,036	4,112	14,722	15,457
9	Salem ..	604	965	633	871	842	721	1,049	932	4,671	4,459	13,927	14,200
10	Coimbatore ..	492	740	531	824	683	699	740	699	4,109	3,819	12,373	12,98
11	The Nilgiris ..	36	63	49	55	76	44	66	29	196	135	975	1,03
12	Kanyakumari ..	139	174	169	210	240	183	383	234	1,089	1,132	3,217	3,220
Total of districts exclusive of Municipal towns and census towns.		5,705	8,713	6,682	9,512	9,339	8,351	10,636	9,444	42,212	41,087	144,558	145,417

STATEMENT No. IV-A.—*Infant deaths according to communities in the Municipal Towns in the State of Madras during the year 1960.*

Municipal Towns.	Hindus.		Muslims.		Christians.		Others.		Total.	
	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
MADRAS DISTRICT.										
Madras	7,570	119.49	907	131.27	333	93.72	16	571.43	8,832	121.64
CHINGLEPUT DISTRICT.										
Kancheepuram ..	230	79.68	8	72.07	1	52.63	..	..	293	79.32
Tiruvellore ..	48	53.04	4	68.97	1	41.67	..	..	53	58.31
Chingleput ..	127	79.93	7	127.27	2	40.00	..	..	136	79.49
Tiruvotiyur ..	63	30.66	3	330.95	3	375.91	..	..	80	225.99
NORTH ARCOT DISTRICT.										
Vellore	617	115.76	133	133.53	20	73.80	1	142.86	771	116.75
Tiruvannamalai ..	170	103.41	20	141.71	3	85.71	..	..	193	103.21
Gudiyatham ..	232	123.18	57	179.25	2	125.00	..	..	291	136.62
Vaniyambadi ..	46	57.33	99	121.53	..	..	..	..	145	80.73
Tirupattur ..	62	48.97	33	98.80	1	45.45	..	..	96	59.19
Walajapet ..	38	51.83	7	101.45	..	..	..	..	45	58.90
Ambur	59	63.93	64	105.07	8	103.90	..	..	131	84.95
Arni	133	95.20	12	112.15	1	71.43	..	..	146	98.18
Arkonam ..	23	27.40	7	59.32	..	..	..	..	29	29.18
Arcot	32	56.61	2	23.57	..	..	..	..	34	53.54
Ranipet	9	10.88	53	479.34	4	75.45	..	..	71	70.93
SOUTH ARCOT DISTRICT.										
Cuddalore ..	155	53.25	6	37.97	..	..	4	40.82	165	51.12
Chidambaram ..	123	61.44	8	67.23	..	..	..	..	131	61.42
Villupuram ..	77	47.12	12	77.12	6	43.48	..	..	95	49.30
Tirudivanam ..	62	49.80	5	48.54	3	90.71	1	62.50	71	50.82
THANJAVUR DISTRICT.										
Thanjavur ..	351	65.18	20	60.61	14	29.70	..	..	385	62.22
Kumbakonam ..	254	52.89	21	65.02	5	22.94	2	400.00	282	52.72
Nagapattinam ..	136	61.68	103	210.84	7	57.38	..	..	246	87.79
Mayuram ..	127	49.69	1	8.77	6	103.45	..	..	134	49.12
Manbagudi ..	132	98.43	7	41.87	4	108.11	..	..	143	67.14
Tiruvavur ..	67	50.99	14	106.87	..	..	..	..	81	55.67
TIRUCHIRAPPALLI DISTRICT.										
Tiruchirappalli ..	445	69.70	51	49.13	37	36.03	..	..	533	59.73
Karur	115	64.14	11	105.80	2	42.55	..	..	128	65.88
Srirangam ..	84	46.88	..	..	..	..	..	..	84	46.00
Pudukkottai ..	133	59.51	10	54.35	11	91.67	..	..	154	60.65
MADURAI DISTRICT.										
Madurai	1,676	95.18	74	62.55	57	61.16	..	..	1,807	91.60
Dindigul ..	291	70.18	10	53.20	11	23.21	..	..	222	64.65
Bodinayakanur ..	81	73.64	3	42.25	4	137.93	..	..	88	73.33
Periyakulam ..	157	114.93	15	62.50	12	97.56	..	..	184	106.42
Palni	111	74.70	9	61.64	3	18.87	..	..	121	71.81
Kodaikanal ..	32	159.20	10	185.18	25	167.30	..	..	67	134.00
Chumbum ..	52	89.35	2	27.03	4	160.67	..	..	58	85.29
RAMANATHAPURAM DISTRICT.										
Rajapalayam ..	164	71.55	7	114.75	5	96.15	..	..	176	73.18
Srivilliputhur ..	174	112.99	4	83.33	8	86.02	..	..	186	110.65
Virudhunagar ..	100	35.92	4	38.46	3	103.00	..	..	112	39.80
Karaikudi ..	78	52.00	7	45.75	2	48.78	..	..	87	61.36
Devakottai ..	33	93.26	6	135.26	..	..	..	..	89	88.65
Sivakasi ..	57	65.97	3	66.67	3	103.45	..	..	63	67.16
Aruppukottai ..	149	92.32	3	56.69	2	200.00	..	..	154	91.83
Ramanathapuram ..	53	54.81	6	17.86	14	150.54	..	..	73	62.29
TIRUNELVELI DISTRICT.										
Tuticorin ..	371	126.97	14	71.46	90	82.57	..	..	475	112.88
Tirunelveli ..	290	111.11	46	102.46	4	36.36	..	..	340	107.72
Palayamkottai ..	212	86.25	15	59.73	21	60.60	..	..	248	81.18
Melapalayam ..	29	127.75	47	101.73	1	90.91	..	..	77	110.60
Shencottah ..	42	64.91	10	107.53	1	62.50	..	..	53	76.71

STATEMENT No. IV-A.—*Infant deaths according to communities in the Municipal Towns in the State of Madras during the year 1960—cont.*

Municipal Towns.	Hindus.		Muslims.		Christians.		Others.		Total.	
	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.	Number.	Rate per 1,000 live-births.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
SALEM DISTRICT.										
Salem	722	67.34	64	75.92	31	108.39	..	..	817	68.95
Rasipuram ..	43	70.26	2	58.52	1	111.11	8	150.94	54	76.27
COIMBATORE DISTRICT.										
Coimbatore ..	1,107	83.98	86	85.57	81	90.50	3	750.00	1,277	84.65
Erode	201	68.99	12	38.83	4	25.32	..	..	217	60.09
Tiruppur ..	162	54.67	14	60.87	9	87.38	..	..	185	56.13
Pollachi ..	181	81.15	10	58.14	3	48.39	..	..	194	81.34
Dharapuram ..	64	56.59	1	8.20	8	84.21	..	..	73	54.67
Udumalpet ..	54	54.13	8	66.12	1	71.43	..	..	83	55.26
Mettupalayam ..	60	46.25	13	58.39	..	..	..	..	82	46.64
Gobichettipalayam ..	55	59.46	3	52.63	2	20.00	..	..	60	60.45
Kurichi	31	78.68	..	..	..	..	..	..	31	70.62
THE NILGIRIS.										
Ootacamund ..	132	98.00	39	151.75	32	82.26	1	333.33	204	102.20
Coonoor	76	88.27	10	76.34	29	97.64	1	500.00	116	89.85
KANYAKUMARI DISTRICT.										
Nagercoil ..	86	35.49	6	24.59	26	28.02	..	..	118	32.52
Colachel ..	5	52.63	1	10.00	14	66.67	..	..	20	49.38
Kuzhithurai ..	5	24.04	..	..	2	10.26	..	..	7	17.11
Padmanabhapuram ..	17	60.71	3	66.67	1	10.20	..	..	21	49.66
Total	18,941	88.39	2,204	105.54	991	69.18	37	148.59	22,233	88.32

STATEMENT No. V.—Deaths registered according to classes in the State of Madras during the year 1960.

[illegible]

* As populations by communities in respect of Shencotiah taluk in Tirunelveli district Chingleput district, North Arcot district and Kanyakumari district are not available in the Census Reports 1911-51, the populations by communities for 1960 could not be estimated and hence the death rates could not be computed.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960.

Serial number (1)	Districts and towns. (2)	Estimated mid-year population which birth and death returns are to be received.		Births.		Birth-rate per thousand estimated mid-year population. (7)	Deaths.					Dysentery and diarrhoea (13)	
		(3)	(4)	Males. (4)	Females. (5)		Total. (6)	(8)	(9)	(10)	(11)		(12)
1	Chingleput	..	..	23,922	22,364	46,316	26.96	2	156	..	58	2,794	1,871
2	North Arcot	..	..	36,162	33,899	70,061	27.67	..	100	..	85	8,251	4,506
3	South Arcot	..	..	2,553,000	27,298	56,964	22.31	3	121	..	15	5,721	2,487
4	Thanjavur	..	..	26,512	24,795	51,307	19.12	1	119	..	17	2,283	813
5	Trichirappalli	..	..	31,574	30,071	61,645	23.72	1	45	..	54	5,130	1,631
6	Madurai	..	..	2,509,000	29,108	55,765	24.84	1	52	..	39	4,268	1,534
7	Ramanathapuram	..	..	2,291,000	26,657	40,210	25.89	..	58	..	65	4,591	1,121
8	Tirunelveli	..	..	1,788,000	19,173	45,415	29.87	..	65	..	3	4,484	1,320
9	Salem	..	..	3,237,000	31,522	65,941	20.37	..	60	14	92	6,612	1,601
10	Coimbatore	..	..	2,760,000	27,743	58,364	21.15	5	77	..	70	3,493	1,588
11	Nilgiris, The	..	..	298,000	3,467	6,730	22.5	..	2	..	5	467	120
12	Kanyakumari	..	..	731,000	8,027	16,737	22.90	..	4	..	2	1,358	835
	Total for Rural areas	..	..	303,121	280,334	583,455	23.58	13	893	14	503	49,402	19,439

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number.	Districts and towns.	Deaths—cont.										Death rate per 1,000 of estimated mid-year population.	
		Suicides.					Injuries.			Total deaths from all causes.			
		Males.	Females.	Wounds and accidents.	Snake bite and killed by wild beasts.	Hydrophobia.	Total.	All other causes.	Males.	Females.	Total.		
		(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
1	Chingleput	44	35	111	72	8	270	15,728	11,917	11,211	23,128	•	0.09
2	North Arcot	115	117	197	63	15	507	20,740	18,438	18,411	36,849	•	0.04
3	South Arcot	57	109	160	72	10	408	20,277	15,897	15,845	31,742	•	0.06
4	Thanjavur	116	94	167	68	21	466	22,043	13,551	11,147	24,698	•	0.03
5	Tiruchirappalli	86	88	176	101	18	469	24,068	16,507	16,705	33,212	•	0.02
6	Madurai	76	110	167	102	12	467	16,672	12,929	13,031	25,960	•	0.02
7	Ramanathapuram	27	40	74	55	5	201	12,174	10,000	10,379	20,379	•	0.03
8	Tirunelveli	35	71	122	57	15	300	22,273	14,722	15,457	30,179	•	0.04
9	Salem	119	153	251	83	13	624	17,294	13,027	11,200	28,127	•	0.02
10	Coimbatore	108	118	203	119	15	563	16,358	12,373	12,498	24,876	•	0.03
11	Nilgiris, The	7	6	9	1	•	23	990	975	793	1,768	•	0.01
12	Kanyakumari	24	10	82	11	7	134	3,480	3,217	3,220	6,437	•	0.01
	Total for Rural areas	814	951	1,719	809	139	4,432	193,737	144,558	145,417	289,975	•	0.04

A. RURAL DISTRICTS—cont.

(DISTRICTS EXCLUSIVE OF MUNICIPAL TOWNS AND CENSUS TOWNS)—cont.

Death rate per 1,000 of estimated mid-year population.—cont.												
Districts and towns.		(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)
		Plague.	Malaria.	Fever.	Dysentery and Diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	Total deaths.	Average published ratio for the previous five years.	Number of maternal deaths.	Rate per 1,000 births (live and still).
A. RURAL DISTRICTS.—cont.												
(DISTRICTS EXCLUSIVE OF MUNICIPAL TOWNS AND CENSUS TOWNS)—cont.												
1	Chingleput	..	0.03	1.63	1.09	1.31	0.16	9.15	13.46	16.19	135	2.81
2	North Arcot	..	0.03	3.26	1.78	1.05	0.20	8.19	14.55	15.81	145	2.06
3	South Arcot	..	0.01	2.24	0.97	0.87	0.16	7.94	12.24	12.71	199	3.51
4	Thanjavur	..	0.01	0.83	0.80	0.44	0.17	8.55	10.36	13.25	227	4.40
5	Tiruchirappalli	..	0.02	1.97	0.63	0.70	0.13	9.26	12.73	14.74	310	5.01
6	Madurai	..	0.02	1.86	0.67	1.20	0.20	7.36	11.34	11.06	147	2.63
7	Ramanathapuram	..	0.01	2.96	0.72	1.01	0.13	8.23	13.12	13.35	98	2.42
8	Tirunelveli	..	0.02	2.51	0.74	0.96	0.17	12.46	16.88	16.81	187	3.49
9	Salem	..	0.03	2.04	0.49	0.57	0.19	5.34	9.69	10.09	160	2.42
10	Coimbatore	..	0.03	1.27	0.53	0.93	0.20	5.94	9.01	10.64	167	2.35
11	Nilgiris, The	..	0.02	1.57	0.40	0.84	0.08	3.02	5.93	8.13	21	3.05
12	Kanyakumari	..	*	1.53	1.14	0.85	0.13	4.76	8.51	9.05	79	4.69
Total for Rural areas		..	0.02	2.00	0.79	0.87	0.13	7.82	11.72	..	1,875	3.29

* Less than 0.01.

A. RURAL DISTRICTS—cont.

(DISTRICTS EXCLUSIVE OF MUNICIPAL TOWNS AND CENSUS TOWNS)—cont.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Districts and towns.		Births.			Deaths.							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Serial number		Estimated mid-year population for which returns are to be received.	Males.	Females.	Total.	Birth-rate per thousand mid-year population.	Cholera.	Smallpox.	Plague.	Malaria.	Fever.	Dysentery, diarrhoea, and
1	M.T.C. Madras	1,915,000	87,081	35,529	72,610	37.92	..	521	..	4	1,478	4,731
Chingleput district.												
2	M.T.C. Kanchipuram.	94,300	2,031	1,726	3,757	39.84	..	1	..	..	37	111
3	" Tiruvallur.	24,600	472	437	909	38.95	..	2	..	..	55	25
4	" Chingleput ..	27,200	910	801	1,711	62.90	..	15	..	..	4	77
5	" Tiruvotiyur ..	30,300	172	182	354	11.68	..	2	..	..	99	20
	M.T.C. total	1,76,400	3,555	3,146	6,701	38.16	..	23	..	..	195	233
6	T.C. Poonamallee ..	22,500	301	277	578	25.69	..	..	..	..	70	64
7	" Uthiramerur ..	12,100	277	270	547	45.21	..	..	..	..	26	44
8	" Alandur ..	17,900	215	176	391	21.84	..	..	..	..	19	29
9	" Pallavaram ..	13,900	122	131	253	18.20	..	..	..	..	5	5
10	" Tirukkalikundram ..	13,200	141	124	265	20.08	..	..	..	..	35	26
11	" Madurantakam ..	9,200	100	106	206	22.39	..	..	..	..	10	2
12	" Wallajabad ..	8,400	197	176	373	44.40	..	..	..	..	11	92
13	" Cheryur ..	5,400	90	105	195	36.11	..	..	..	..	10	12
14	" Arani ..	6,000	117	115	232	38.62	..	..	..	..	27	13
15	" St. Thomas Mount ..	20,500	175	132	307	14.98	..	..	..	..	6	2
16	" Villivakkam ..	13,700	79	77	156	11.39	..	..	..	..	22	20
17	" Sriperumbudur ..	9,200	95	96	191	20.76	..	..	..	..	26	28
18	" Tambaram ..	33,700	78	71	149	4.42	..	..	..	..	14	4
19	" Kunnathur ..	17,300	251	263	514	29.71	..	..	..	..	33	4
20	" Ponneri ..	12,200	22	22	44	3.61	..	..	..	..	4	2
	T. C. total	216,100	2,260	2,141	4,401	20.37	..	19	..	12	318	305
	Urban areas	392,500	5,845	5,257	11,102	28.36	..	42	..	12	513	538

North Arcot district.

21	M.T.C. Vellore	..	..	138,200	3,427	3,177	6,604	47.7.9	..	..	..	..
22	" Tiruvannamalai.	..	..	47,400	974	896	1,870	39.45	..	..	..	..
23	" Gudiyatham.	..	..	57,800	1,039	1,031	2,130	36.83	..	..	..	..
24	" Vaniyambadi.	..	..	45,600	819	797	1,616	35.14	..	..	..	..
25	" Tirupattur.	..	..	30,700	850	772	1,622	52.83	..	..	..	..
26	" Walajpet.	..	..	14,000	410	354	764	54.57	..	..	..	..
27	" Ambur.	..	..	47,700	778	764	1,542	32.33	..	..	..	..
28	" Arni.	..	..	29,100	831	657	1,518	52.16	..	..	..	..
29	" Arkonam.	..	..	30,100	505	489	994	33.02	..	..	..	..
30	" Arcot.	..	..	25,400	333	302	635	25.00	..	..	..	..
31	" Ranipet.	..	..	23,300	530	471	1,001	42.96	..	..	..	..
	M.T.C. total	..	..	489,300	10,556	9,740	20,296	41.48	..	..	..	..
32	T.C. Tiruvotiyur	..	..	16,200	218	209	413	25.20	..	..	..	..
33	" Polur.	..	..	18,800	163	161	323	17.71	..	..	..	..
34	" Vishnambur.	..	..	13,600	154	125	279	20.5	..	..	..	..
35	" Pernampet.	..	..	23,800	131	146	277	11.61	..	..	..	..
36	" Sholinghur.	..	..	11,800	134	111	245	20.76	..	..	..	..
37	" Pallikonda.	..	..	12,000	122	126	248	20.67	..	..	..	..
38	" Wandiwash.	..	..	14,500	127	116	243	16.76	..	..	..	..
39	" Kalambar.	..	..	9,900	178	149	327	33.03	..	..	..	..
40	" Chetpet.	..	..	12,300	137	152	289	23.50	..	..	..	..
41	" Kaveripakkam.	..	..	9,400	87	93	180	19.68	..	..	..	..
42	" Panappakkam.	..	..	5,100	81	70	151	29.61	..	..	..	..
	T.C. total	..	..	147,400	1,538	1,457	2,995	20.32	..	..	..	..
	Urban areas	..	..	636,700	12,094	11,197	23,291	36.57	..	..	..	..

South Arcot district.

43	M.T.C. Cuddalore.	..	..	77,000	1,674	1,554	3,228	41.92	..	..	..	..
44	" Chidambaram.	..	..	42,700	1,095	1,108	2,183	49.95	..	..	..	..
45	" Villupuram.	..	..	46,800	972	935	1,907	41.16	..	..	..	..
46	" Thadivaram.	..	..	40,400	687	710	1,397	34.58	..	..	..	..
	M.T.C. total	..	..	206,900	4,327	4,207	8,534	41.93	..	..	..	..
47	T.C. Pauruti.	..	..	14,600	256	201	457	31.30	..	..	..	..
48	" Porto Novo.	..	..	15,900	188	192	380	23.90	..	..	..	..
49	" Nellikuppam.	..	..	27,600	332	307	639	23.15	..	..	..	..
50	" Tirukoilur.	..	..	18,500	457	410	867	46.86	..	..	..	..
51	" Pennadam.	..	..	7,800	111	105	216	23.39	..	..	..	..
52	" Kurinjipadi.	..	..	11,200	91	87	178	15.89	..	..	..	..
53	" Maonagudi.	..	..	11,900	98	104	202	16.97	..	..	..	..
54	" Virudachalam.	..	..	13,700	203	190	393	28.31	..	..	..	..
55	" Bhuvanagiri.	..	..	11,700	79	65	144	12.31	..	..	..	..
56	" Kallakurichi.	..	..	12,900	66	68	134	10.39	..	..	..	..
57	" Chinnasalem.	..	..	11,000	78	70	148	13.45	..	..	..	..

Serial number	Districts and towns	Deaths—cont.										Death rate per 1,000 of estimated mid-year population.		
		Suicides.				Injuries.			Total deaths from all causes.					
		Respiratory diseases.	Males	Females.	Wounds and accidents.	Snake bite and killed by wild beasts.	Hydrophobia.	Total.	All other causes.	Males.	Females.		Total.	
		(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
B. TOWNS—cont.														
MUNICIPALITIES AND CENSUS TOWNS—cont.														
Madras—c. ut.														
1	M.T.C., Madras	8,718	65	64	253	16	..	398	17,879	17,194	16,535	33,729	..	0.21
2	M.T.C., Chingleput district.													
3	M.T.C., Kanchipuram	390	2	..	15	..	3	20	925	737	750	1,487	..	0.04
4	" Tiruvellore	15	..	..	1	..	..	1	139	124	118	237	..	0.08
5	" Chingleput	136	..	..	16	..	2	18	323	278	250	528	..	0.55
6	" Tiruvotthiyur	30	..	..	4	1	..	5	144	160	190	350	..	0.07
	M.T.C. total	571	2	..	36	1	5	44	1,536	1,289	1,303	2,602	..	0.13
7	T.C., Poonamallee	20	..	..	2	..	..	2	44	113	87	260	..	..
8	" Uthiramerur	19	1	..	1	1	..	3	170	140	127	267	..	0.33
9	" Alandur	14	1	..	1	..	..	2	118	95	88	183	..	..
10	" Pallavaram	..	..	..	..	1	..	1	62	43	31	74	..	0.07
11	" Tirukkalkundram	21	1	..	4	3	1	9	35	34	47	131	..	..
12	" Madurantakam	2	..	..	..	..	..	..	59	33	55	88	..	..
13	" Walajabad	8	2	2	..	1	..	5	45	50	44	94	..	..
14	" Cheyyur	2	..	1	..	..	..	1	47	44	30	74	..	0.19
15	" Arani	11	..	1	..	..	..	1	34	45	44	89	..	0.38
16	" St. Thomas Mount	3	..	..	..	..	..	..	27	22	16	38	..	..
17	" Villivakkam	18	..	..	1	..	..	1	71	72	60	132	..	..
18	" Sriperumbudur	16	..	..	5	..	..	5	45	59	59	118	..	..
19	" Tambaram	8	..	..	1	..	..	1	19	29	18	47	..	..
20	" Kuarahur	23	..	..	1	..	..	1	75	97	79	176	..	..
21	" Ponneri	4	..	1	2	..	..	3	16	14	15	29	..	..
	T.C. total	169	5	5	13	6	1	35	867	945	780	1,725	..	0.09
	Urban areas total	740	7	5	54	7	6	79	2,403	2,244	2,083	4,327	..	0.11

North Arcot District.															
21	M.T.C. Vellore	..	..	570	2	1	70	2	4	79	2,105	1,723	1,404	3,127	0.06
22	" Tiruvannamalai	..	..	179	1	1	21	3	3	29	242	453	489	942	0.1
23	" Gudiyatham	..	..	146	..	2	5	..	..	7	265	511	480	971	0.05
24	" Vaniyambadi	..	..	108	..	..	2	..	..	..	283	249	253	592	..
25	" Tirupattur	..	..	59	..	..	10	..	..	10	338	244	231	475	..
26	" Walajpet	..	..	3	..	1	..	..	..	1	134	92	101	193	..
27	" Ambur	..	..	96	..	..	..	..	..	3	216	271	223	494	..
28	" Arani	..	..	112	2	1	3	1	..	6	247	290	280	570	0.13
29	" Arkonam	..	..	32	..	..	8	..	..	1	106	101	102	203	..
30	" Arcot	..	..	25	..	..	1	..	..	1	58	86	73	150	..
31	" Ranipet	..	..	43	..	..	7	..	..	7	242	216	170	386	..
	M.T.C. total	..	..	1,373	5	6	124	6	7	148	4,576	4,236	3,786	8,022	0.04
32	T.C. Tiruvottiyur	..	..	19	1	1	..	..	..	..	124	120	130	259	..
33	" Polur	..	..	18	..	..	2	..	..	6	113	80	95	175	..
34	" Vaharan	..	..	3	..	1	4	..	..	3	81	35	71	156	..
35	" Pernampet	..	..	..	..	..	..	..	..	..	12	37	32	69	..
36	" Sholinghur	..	..	2	..	..	..	..	..	..	69	57	46	103	..
37	" Palikonda	..	..	12	..	1	1	..	..	2	43	45	50	95	0.17
38	" Wandhiwaah	..	..	9	..	1	1	..	4	5	55	66	51	117	..
39	" Kalambur	..	..	23	1	1	1	1	..	2	38	110	92	202	0.10
40	" Chetpet	..	..	12	..	1	1	..	..	2	97	92	96	188	..
41	" Kaverippakkam	..	..	7	..	..	1	1	..	1	32	31	38	69	..
42	" Panappakkam	..	..	11	..	..	1	1	..	1	14	33	33	66	..
	T.C. total	..	..	116	2	4	10	3	4	23	678	756	743	1,499	0.02
	Urban areas total	..	..	1,489	7	10	134	9	11	171	5,554	4,992	4,529	9,521	0.04
South Arcot District.															
43	M.T.C. Cuddalore	..	..	93	6	1	44	2	4	54	789	551	533	1,084	0.08
44	" Chidambaram	..	..	46	..	..	6	..	..	8	513	322	288	610	0.30
45	" Villupuram	..	..	37	1	..	8	..	1	10	345	305	250	555	0.11
46	" Tindivanam	..	..	49	..	..	12	..	1	13	161	164	138	302	..
	M.T.C. total	..	..	225	6	1	70	2	6	85	1,808	1,342	1,209	2,551	0.61
47	T.C. Paurai	..	..	17	1	1	..	..	..	4	68	82	71	153	0.75
48	" Porto Novo	..	..	7	..	..	2	..	..	2	68	53	53	110	0.31
49	" Nellikuppam	..	..	24	1	1	1	1	..	2	137	118	106	218	0.18
50	" Tirukoilur	..	..	..	..	..	..	..	..	1	188	145	133	278	0.54
51	" Pennadam	..	..	3	..	..	..	..	..	..	53	39	35	74	..
52	" Kurinjipedi	..	..	2	..	..	..	..	..	..	10	4	19	14	..
53	" Mannargudi	..	..	2	..	1	1	..	..	1	62	35	35	70	..
54	" Virudhachalam	..	..	9	..	..	..	..	..	..	38	45	39	84	..
55	" Bhuvanagiri	..	..	1	..	..	..	..	..	..	28	35	35	63	..
56	" Kallakurichi	..	..	1	..	..	..	..	..	..	82	41	41	82	0.09
57	" Odhanasalem	..	..	..	..	..	..	1	..	1	45	40	35	75	..

Serial number.		Districts and towns.		Death rate per 1,000 of estimated mid-year population.— <i>cont.</i>															
				and		dis-		Injuries.		All other causes.		From all causes.		Number of maternal deaths.		Rate per 1,000 births (live and still).		Number of months for which complete returns have been received.	
		(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)			(36)	(37)	(38)				
		Plague.	Malaria.	Revera.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.		Total deaths.	Average of published ratio for five years.									
B. TOWNS—<i>cont.</i>																			
MUNICIPALITIES AND CENSUS TOWNS—<i>cont.</i>																			
Madras—<i>cont.</i>																			
1	M.T.C. Madras	..	*	0.77	2.47	4.55	0.21	9.34	17.01	20.00	11.9	1.59	..	..	..				
Chingleput district.																			
2	M.T.C. Kanchipuram	..	..	0.89	1.18	4.14	0.21	9.81	15.77	20.16	46	11.79	..	..	..				
3	" Tiruvallur	..	..	2.24	1.02	0.61	0.04	5.65	9.68	13.80	..	..	..	..	..				
4	" Chingleput	..	..	0.15	0.99	0.80	0.66	12.06	19.41	19.80	5	2.68	..	..	..				
5	" Tiruvotiyur	..	..	3.27	2.31	0.99	0.17	4.75	11.55	11.6	..	..	..	..	..				
M.T.C. total																			
		..	..	1.11	1.32	3.24	0.25	8.71	14.75	..	51	7.21	..	..	..				
T.C. total																			
Urban areas total																			
6	T.C. Poonamallee	..	..	3.11	2.84	0.89	0.09	1.06	8.89	3.48	2	3.35	..	..	..				
7	" Uththamer	..	..	2.15	3.64	1.57	0.25	14.05	22.07	20.12	3	5.41	..	..	..				
8	" Pallavaram	..	..	1.06	1.63	0.78	0.11	6.59	10.32	10.02	..	..	..	..	..				
9	" Tirukalundam	..	..	0.36	0.36	0.75	0.07	4.46	6.33	6.18	1	3.94	..	..	..				
10	" Madhavakam	..	..	2.65	1.97	1.59	0.88	2.65	9.92	11.49	3	11.32	..	..	..				
11	" Madhavakam	..	..	1.09	0.29	0.22	0.41	6.41	7.63	16.63	..	..	..	..	..				
12	" Walajah	..	..	1.31	2.65	0.37	0.60	5.86	11.19	13.38	..	..	..	..	..				
13	" Cheruvu	..	..	1.85	2.25	0.37	0.19	8.70	16.23	16.23	..	..	..	..	..				
14	" St. Thomas Mount	..	..	3.91	0.43	1.59	0.14	4.93	12.90	12.34	..	..	..	..	..				
15	" Villavakkam	..	..	0.29	0.16	0.15	0.14	1.32	1.85	4.75	..	..	..	..	..				
16	" Sripuram	..	..	1.61	1.40	1.31	0.07	5.18	9.64	8.46	..	..	..	..	..				
17	" Sripuram	..	..	2.53	2.38	1.74	0.54	4.89	12.83	12.34	1	5.24	..	..	..				
18	" Tanjaram	..	..	0.42	0.32	0.24	0.03	0.66	1.89	2.27	..	..	..	..	..				
19	" Kumbalur	..	..	1.91	2.54	1.33	0.06	4.84	10.17	6.61	4	7.59	..	..	..				
20	" Ponnur	..	..	0.33	0.16	0.38	0.25	1.31	2.38	2.76	..	..	..	..	..				
T.C. total																			
Urban areas total																			
		..	..	1.47	1.41	0.78	0.16	4.01	7.98	..	14	3.14	..	..	..				
		..	..	1.31	1.37	1.39	0.20	6.12	11.02	..	65	5.38	..	..	..				

North Arcot district.													
21	M.T.C., Vellore	..	..	0.02	0.54	2.08	4.12	0.57	15.23	22.63	21.96	28	4.03
22	" Tiruvannamalai	..	..	..	1.77	2.18	3.74	0.61	11.43	19.87	16.10	24	12.10
23	" Gudiyatham	..	..	0.02	0.64	2.63	2.53	0.12	10.81	16.80	14.84	4	1.80
24	" Vandyambadi	..	..	0.04	1.32	1.36	2.37	0.04	5.57	11.01	12.63	6	3.54
25	" Tirupattur	..	..	..	1.11	1.11	0.92	0.83	11.61	13.79	16.92	7	3.99
26	" Walsajpet	..	..	..	1.99	1.21	0.21	0.06	4.53	10.36	17.10	1	1.25
27	" Ambur	..	..	..	2.78	1.76	2.01	0.21	8.49	19.59	21.31	1	0.63
28	" Arni	..	..	..	1.20	4.26	3.83	0.21	3.52	6.74	6.93	..	..
29	" Arkonam	..	..	..	1.85	1.70	1.06	0.04	2.28	6.26	8.01	..	..
30	" Arcot	..	..	0.09	2.10	1.36	0.92	0.80	10.89	16.57	18.88	6	5.56
31	" Baupet	..	..	0.02	1.30	1.95	2.81	0.30	9.97	16.39	..	80	3.74
M.T.C. total													
32	T.C., Tiruvottiyur	..	..	9.06	5.06	2.04	1.17	0.32	7.45	15.99	18.82	3	7.18
33	" Polur	..	..	..	1.65	1.17	0.16	0.32	6.01	9.31	8.26	..	..
34	" Vebaram	..	..	..	2.72	1.25	1.32	0.22	5.96	11.47	11.37	3	10.71
35	" Pernampet	..	..	..	1.55	0.84	0.17	..	0.50	2.90	3.98	..	..
36	" Sholinghur	..	..	..	2.08	0.51	0.17	..	5.85	8.73	12.05	..	..
37	" Pallikonda	..	..	..	1.93	0.92	1.00	0.17	3.63	7.92	11.63	2	8.06
38	" Wandiwash	..	..	..	10.20	1.24	0.62	0.34	3.79	8.07	8.45	4	15.81
39	" Kalambur	..	..	..	4.96	1.30	0.93	0.20	3.54	20.40	20.15	1	3.06
40	" Chetpet	..	..	..	1.17	1.30	0.21	0.16	7.80	15.12	15.12	..	..
41	" Kaveripakkam	..	..	..	3.33	1.81	0.74	0.21	3.40	7.34	12.69	1	5.41
42	" Panappakkam	..	..	..	..	4.51	2.16	0.20	2.74	12.94	17.69	1	6.62
T.C. total													
Urban areas total													
South Arcot district.													
43	M.T.C., Cuddalore	..	..	..	0.97	0.87	1.21	0.70	10.25	14.08	16.67	35	10.87
44	" Chidambaram	..	..	..	2.46	0.92	1.08	0.19	1.01	14.23	15.78	15	6.64
45	" Villupuram	..	..	..	1.04	0.92	1.21	0.21	7.37	11.86	14.69	6	2.97
46	" Tindivanam	..	..	..	..	0.81	1.09	0.32	3.99	7.47	14.08	4	2.79
M.T.C. total													
47	T.C., Pauruti	..	..	..	3.22	0.41	1.16	0.27	4.66	10.48	11.90	3	6.52
48	" Porto Novo	..	..	..	1.45	0.31	0.44	0.13	4.28	6.02	8.47	1	2.63
49	" Nellikuppam	..	..	..	0.72	1.09	0.87	0.07	4.96	7.90	6.75	2	3.07
50	" Tirukolur	..	..	..	3.51	0.76	0.76	0.05	10.16	15.03	11.90	..	..
51	" Panadam	..	..	..	1.45	0.92	0.38	0.16	6.97	9.74	12.02	1	17.64
52	" Karinjipadi	..	..	..	6.18	..	0.38	..	0.80	1.25	5.42	..	..
53	" Manargudi	..	..	..	0.42	..	0.17	0.08	5.21	5.88	7.93	..	..
54	" Vrindachalam	..	..	0.36	1.00	0.44	0.66	..	2.77	6.13	9.70	2	6.01
55	" Puvanaigri	..	..	..	0.05	0.02	0.01	..	1.53	5.33	10.27	2	13.79
56	" Kalakurichi	..	..	..	..	0.36	0.09	..	6.36	6.36	7.98	..	..
57	" Channarayana	..	..	..	2.13	0.36	0.09	0.03	4.69	6.82	6.60	..	..

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number	Districts and towns.	Births.			Deaths.									
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
B. TOWNS—cont.														
MUNICIPALITIES AND CENSUS TOWNS—cont.														
South Arcot district—cont.														
58	T.C., Valavanur ..	..	..	9,400	82	71	153	16.28	..	..	..	..	30	5
59	" " Srirangam ..	..	..	7,800	86	93	179	23.55	..	..	..	..	4	2
60	" " Ulundurpet ..	..	..	6,900	61	65	126	18.26	..	..	..	..	263	81
	T. C. total ..	..	..	180,500	2,128	1,854	4,012	22.23	..	34	..	5	505	248
	Urban areas total ..	..	..	87,400	6,486	6,211	12,697	32.77	..	53	..	5	..	..
Thanjavur district.														
61	M.T.C., Thanjavur ..	..	..	130,500	8,157	3,083	6,153	47.42	..	..	..	..	58	105
62	" " Kumbakonam ..	..	..	114,500	2,796	2,652	5,448	46.67	..	..	..	..	98	66
63	" " Nagapattinam ..	..	..	62,400	1,501	1,324	2,825	45.27	..	..	..	..	110	107
64	" " Mayuram ..	..	..	53,500	1,390	1,338	2,728	50.99	..	..	..	..	26	4
65	" " Manargudi ..	..	..	36,000	1,041	1,089	2,130	59.17	..	..	..	..	39	36
66	" " Tiruvarur ..	..	..	51,900	744	711	1,455	45.61	..	..	..	..	28	24
	M. T. C. Total ..	..	..	428,900	10,629	10,045	20,674	48.20	..	29	..	1	359	342
Tiruchirappalli district.														
67	T.C., Tiruchirappalli ..	..	..	19,200	134	153	342	17.81	..	..	..	..	44	10
68	" " Karaikal ..	..	..	17,600	494	466	990	56.25	..	..	..	..	5	1
69	" " Tiruchirappalli ..	..	..	8,500	108	119	227	23.16	..	..	..	..	45	1
70	" " Karaikal ..	..	..	18,700	148	148	302	16.15	..	..	..	..	1	..
71	" " Karaikal ..	..	..	8,500	211	249	459	51.00	..	..	..	..	10	..
72	" " Tiruvattar ..	..	..	16,600	275	240	524	31.37	..	..	..	..	7	..
73	" " Karaikal ..	..	..	23,400	97	88	185	7.91	..	..	..	..	14	..
74	" " Karaikal ..	..	..	15,900	232	159	391	24.59	..	..	..	..	11	..
75	" " Karaikal ..	..	..	11,000	133	97	230	20.91	..	..	..	..	2	..
76	" " Karaikal ..	..	..	13,200	115	90	205	15.53	..	..	..	..	11	2

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

[illegible]

• Less than 0.01.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number.	Districts and towns.	Births.		Estimated mid-year population for which returns are to be received.	Deaths.									
		Males.	Females.		Total.	(7) Birth-rate per 1,000 of estimated year population.	(8) Cholera.	(9) Smallpox.	(10) Plague.	(11) Malaria.	(12) Typhoid.	(13) Dysentery and diarrhoea.		
B. TOWNS—cont.														
Municipalities and Census Towns—cont.														
Madurai district.														
115	M. T. C., Madurai ..	476,200	9,491	19,726	41.40	..	58	..	..	..	..	3	1,094	949
116	" Dindigul ..	99,000	1,824	8,434	21.69	..	21	..	..	..	..	1	66	280
117	" Bodinayakanur ..	42,900	852	3,720	48.30	..	3	..	..	..	..	1	31	75
118	" Periyakulam ..	36,800	814	1,729	38.86	..	2	..	..	..	..	..	6	147
119	" Palani ..	48,600	858	1,645	38.85	..	..	..	..	..	..	..	17	74
120	" Kodalkanal ..	12,000	254	500	41.67	..	..	..	..	..	..	1	46	19
121	" Cumbum ..	31,300	366	680	21.73	..	..	..	..	..	..	..	44	..
	M.T.C. Total ..	740,800	13,579	28,954	39.08	..	92	..	..	..	..	3	1,094	949
T. C., Gudalur ..														
122	" Thevaran ..	22,300	156	363	16.28	..	1	..	..	..	..	..	17	1
123	" Chinnamanur ..	23,000	138	308	25.67	..	..	..	..	..	..	..	49	24
124	" Thirumanthapur ..	20,800	104	237	14.65	..	..	..	..	..	..	..	6	45
125	" Thirumanthapur ..	18,500	106	291	28.96	..	..	..	..	..	..	..	33	26
126	" Uthamapalayam ..	28,900	374	773	32.34	..	2	..	..	..	..	1	62	37
127	" Allinagar ..	15,300	218	317	20.72	..	..	..	..	..	..	..	13	8
128	" Sholavandan ..	16,200	213	434	26.79	..	..	..	..	..	..	1	14	10
129	" Usilampatti ..	9,900	57	106	10.82	..	..	..	..	..	..	..	4	3
130	" Andipatti ..	11,900	183	369	31.01	..	..	..	..	..	..	..	67	15
131	" Kumbal ..	12,500	196	417	33.36	..	..	..	..	..	..	1	8	5
132	" Balagundu ..	18,300	311	636	34.75	..	..	..	..	..	..	1	15	12
133	" Melur ..	12,000	173	345	28.75	..	..	..	..	..	..	..	21	13
134	" Natham ..	12,100	80	177	14.63	..	..	..	..	..	..	..	38	12
135	" Tiruparankundram ..	14,700	97	215	14.83	..	..	..	..	..	..	1	..	..
136	" Ayakudi ..	8,300	104	180	21.69	..	..	..	..	..	..	..	..	..
137	" Elumalai ..	6,100	49	94	15.41	..	..	..	..	..	..	..	..	..
138	" Nilakottai ..	252,700	3,003	6,185	24.48	..	5	..	..	..	..	5	379	240
	T.C. total ..	993,500	16,892	35,139	35.37	..	97	..	..	..	..	8	1,473	1,189
	Urban areas total ..					..		..	..	..	..			

Ramanathapuram district.

139	M.T.C., Ramanathapuram ..	74,500	1,136	2,405	1,269	1,136	2,405	32.28	..	..	..	..	203	153
140	" Sathiyapur ..	45,800	821	1,860	821	860	1,860	36.70	..	..	..	..	95	65
141	" Virudhunagar ..	57,300	1,434	2,814	1,434	1,380	2,814	49.11	..	..	..	..	114	75
142	" Karakudi ..	47,400	826	1,694	826	868	1,694	35.74	..	..	..	..	121	25
143	" Devakottai ..	27,500	548	1,004	548	456	1,004	36.51	..	..	..	..	6	46
144	" Sivakasi ..	28,200	479	938	479	459	938	33.26	..	..	..	..	62	36
145	" Aruppukottai ..	61,200	868	1,677	868	809	1,677	27.40	..	..	..	1	95	143
146	" Ramanathapuram ..	29,600	719	1,396	719	677	1,396	47.16	..	..	..	..	55	54
	M.T.C. total ..	371,500	6,645	13,009	6,645	6,645	13,009	36.63	..	..	..	1	751	602
T.C. total ..														
147	T.C., Paramakudi ..	28,500	653	1,153	653	503	1,153	43.70	..	..	..	..	46	30
148	" Sivagangudi ..	17,000	281	534	281	254	534	31.47	..	..	..	..	11	13
149	" Sivagangudi ..	18,400	400	743	400	348	743	45.30	..	..	..	..	65	14
150	" Tirupattur ..	10,700	310	590	310	280	590	32.78	..	..	..	..	6	9
151	" Tirupattur ..	9,500	71	136	71	65	136	12.71	..	..	..	..	14	8
152	" Kozhikudi ..	9,500	89	101	89	101	101	20.00	..	..	..	..	52	4
153	" Vattap ..	10,500	135	222	135	117	222	25.71	..	..	..	..	33	10
154	" Sathiyapur ..	5,400	102	177	102	75	177	16.26	..	..	..	..	13	7
155	" Sathiyapur ..	17,000	185	373	185	188	373	69.07	..	..	..	..	12	..
156	" Sathiyapur ..	17,000	124	237	124	113	237	13.91	..	..	..	..	16	..
157	" Manamadurai ..	31,100	119	137	119	137	137	23.66	..	..	..	..	20	..
158	" Tirupattur ..	15,600	82	157	82	75	157	10.06	..	..	..	..	12	..
159	" Kozhikudi ..	6,800	147	304	147	159	304	51.61	..	..	..	1	20	..
160	" Kozhikudi ..	18,000	79	175	79	50	175	23.04	..	..	..	..	4	..
161	" Kozhikudi ..	18,000	172	347	172	175	347	19.2*	..	..	..	1	12	..
162	" Kozhikudi ..	7,000	83	187	83	92	187	26.14	..	..	..	..	42	..
163	" Kozhikudi ..	7,000	142	316	142	174	316	52.67	..	..	..	..	4	..
164	" Kozhikudi ..	6,000	32	79	32	47	79	13.62	..	..	..	..	5	..
165	" Kozhikudi ..	5,800	98	195	98	97	195	31.45	..	..	..	1	7	..
166	" Kozhikudi ..	6,300	74	142	74	62	142	22.52	..	..	..	..	10	..
167	" Kozhikudi ..	6,300	74	142	74	62	142	22.52	..	..	..	..	10	..
168	" Singampet ..	248,100	3,650	6,996	3,650	2,340	6,996	28.20	..	..	..	14	413	173
	T.C. total ..	619,600	10,420	20,805	10,420	9,985	20,805	33.26	..	..	..	15	1,164	775
Urban areas total ..														
Tirunelveli district.														
169	M.T.C., Tirunelveli ..	129,500	2,064	4,203	2,064	2,064	4,203	34.89	..	..	..	2	57	262
170	" Tirunelveli ..	85,400	1,564	3,240	1,564	1,564	3,240	37.94	..	..	..	..	89	168
171	" Palayamkottai ..	43,400	1,480	3,055	1,480	1,480	3,055	63.12	..	..	..	..	39	20
172	" Palayamkottai ..	43,400	368	700	368	332	700	16.13	..	..	..	..	28	20
173	" Shencottah ..	19,700	414	756	414	342	756	38.38	..	..	..	..	304	515
	M.T.C. total ..	317,500	6,095	11,959	6,095	5,864	11,959	37.67	..	..	..	2	304	515
T.C. total ..														
174	T.C., Tenkasi ..	38,700	653	1,260	653	607	1,260	32.56	..	..	..	..	105	62
175	" Kadayalur ..	46,000	417	769	417	352	769	16.72	..	..	..	..	37	28
176	" Pullyangudi ..	31,300	119	230	119	111	230	7.35	..	..	..	..	16	5

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number.	Districts and towns.	Deaths—cont.										Total deaths from all causes.			Death rate per 1000 of estimated mid-year population.								
		Injuries.																					
		Suicides.				Snake-bite and killed by wild beasts.																	
		Males.		Females.		Wounds and accidents.								Males.		Females.		Total.					
		(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)									
B. TOWNS—cont.																							
MUNICIPALITIES AND CENSUS TOWNS—cont.																							
Madurai district—cont.																							
116	M.T.C. Madurai ..	990	10	5	97	3	4	119	5,376	3,046	3,768	7,712	..	..	0.12	..	..	Cholera.	(25)	(26)			
117	" " Dindigul ..	84	1	1	21	2	3	13	682	535	496	1,051	..	..	0.08	..	..	Smallpox.	(25)	(26)			
118	" " Rodeyakannur ..	29	6	2	4	..	1	13	248	224	229	453	..	..	0.49	..	..						
119	" " Pedyakulam ..	124	3	2	11	1	..	17	479	395	407	802	..	..	0.08	..	..						
120	" " Palani ..	159	..	1	13	1	4	19	328	285	303	588	..	..	0.05	..	..						
121	" " Kodakanal ..	72	..	..	2	1	1	8	94	111	92	203	..	..	..	..	..						
122	" " Cumbum ..	10	..	..	..	..	..	..	149	124	129	253	..	..	..	..	..						
	M.T.C. total ..	1,468	20	11	148	8	13	200	7,256	5,640	5,422	11,062	..	..	0.12	..	..						
T.C. Gudalur																							
123	" " Thevaram ..	9	..	..	1	1	..	2	86	57	59	116	..	..	0.04	..	..						
124	" " Chinnamanur ..	2	..	..	..	..	..	..	71	82	64	146	..	..	0.04	..	..						
125	" " Thirumangalam ..	37	1	1	1	..	..	2	134	127	97	224	..	..	..	..	..						
126	" " Uthamapalayam ..	46	1	1	2	2	..	5	69	98	81	179	..	..	..	..	..						
127	" " Allinagar ..	9	..	2	4	1	..	7	84	102	100	202	..	..	0.08	..	..						
128	" " Sholavandan ..	..	..	..	..	..	..	1	71	52	44	96	..	..	..	..	..						
129	" " Uthampatti ..	5	..	..	..	..	3	3	58	40	51	91	..	..	..	..	..						
130	" " Andipatti ..	9	..	..	..	..	..	1	..	7	10	17	..	..	..	..	..						
131	" " Battagundu ..	16	..	2	3	..	..	5	64	80	87	167	..	..	..	..	..						
132	" " Meir ..	10	..	..	1	..	..	1	76	54	47	101	..	..	..	..	..						
133	" " Natham ..	19	1	..	1	..	1	3	76	66	60	126	..	..	..	..	..						
134	" " Thiruparankundram ..	10	1	1	..	2	..	1	76	51	56	107	..	..	..	..	..						
135	" " Ayakudi ..	1	..	..	..	..	..	1	71	59	57	116	..	..	..	..	..						
136	" " Himala ..	5	..	2	1	..	..	3	27	37	33	72	..	..	..	..	..						
137	" " Nilakottai ..	..	..	..	..	..	..	..	32	16	17	33	..	..	0.16	..	..						
	T.C. total ..	197	4	9	16	6	4	39	1,157	1,045	977	2,022	..	..	0.02	..	..						
	Urban areas total ..	1,665	24	20	164	14	17	239	8,413	6,685	6,399	13,084	..	..	0.10	..	..						

139	M.T.C. Kanyakumari ..	96	..	..	..	..	..	418	498	437	875	..	..	..	..	0.01	..
140	" " Sirkkappuram ..	43	..	3	..	..	3	506	352	362	714	..	..	..	..	..	..
141	" " Virudhunagar ..	45	..	3	..	..	5	361	317	286	603	..	..	..	..	..	..
142	" " Karakudi ..	26	1	4	..	..	8	271	229	222	451	..	..	..	..	..	..
143	" " Devakottai ..	37	1	2	..	..	5	266	186	174	360	..	..	..	..	..	..
144	" " Sivakasi ..	26	..	1	..	..	2	144	139	131	270	..	..	..	..	..	..
145	" " Aruppukottai ..	72	2	9	..	..	11	574	454	441	895	..	..	..	..	..	..
146	" " Ramanathapuram ..	4	1	6	3	..	10	294	213	205	418	..	..	..	..	..	..
	M.T.C. total ..	349	4	29	6	3	44	2,834	2,328	2,258	4,586	..	..	..	..	0.01	..
147	T.C. Parambadi ..	11	..	..	..	..	..	119	107	99	206	..	..	..	..	..	..
148	" " Rayagudi ..	12	..	..	..	..	..	69	52	56	108	..	..	..	..	..	..
149	" " Sivagangai ..	21	..	16	..	..	25	197	134	158	292	..	..	..	..	..	..
150	" " Tirupattur ..	8	..	2	..	..	3	114	64	76	140	..	..	..	..	..	..
151	" " Aliraman ..	..	..	..	..	..	..	51	29	22	51	..	..	..	..	..	..
152	" " Kandi ..	..	..	..	..	..	..	40	43	33	81	..	..	..	..	..	..
153	" " Sathur ..	7	..	1	..	..	3	50	57	71	128	..	..	..	..	..	..
154	" " Sathur ..	5	..	3	..	..	1	32	35	40	75	..	..	..	..	..	..
155	" " Sathur ..	13	..	..	..	..	..	127	86	80	166	..	..	..	..	..	..
156	" " Sathur ..	7	..	..	..	..	2	75	61	42	108	..	..	..	..	..	..
157	" " Manamadurai ..	4	..	1	..	..	1	98	65	53	118	..	..	..	..	..	..
158	" " Tirupuvanam ..	10	..	..	..	..	..	118	71	81	152	..	..	..	..	..	..
159	" " Kandi ..	4	..	..	..	..	..	19	15	20	35	..	..	..	..	..	..
160	" " Kandi ..	5	..	..	..	..	..	48	35	41	76	..	..	..	..	..	..
161	" " Pallathur ..	1	..	..	..	..	..	36	21	28	49	..	..	..	..	..	..
162	" " Kilakudi ..	2	..	..	..	..	..	57	36	40	76	..	..	..	..	..	..
163	" " Rameswaram ..	3	..	..	..	..	..	83	23	24	47	..	..	..	..	..	..
164	" " Pannanpatti ..	30	1	..	..	..	2	80	89	102	191	..	..	..	..	..	..
165	" " Kattaramkottai ..	9	..	4	..	..	6	52	43	28	71	..	..	..	..	..	..
166	" " Kattaramkottai ..	..	..	..	..	..	..	20	19	13	32	..	..	..	..	..	..
167	" " Kattaramkottai ..	1	..	..	..	..	..	143	75	73	153	..	..	..	..	..	..
168	" " Kattaramkottai ..	1	..	..	..	..	..	30	27	16	43	..	..	..	..	..	..
	T.C. total ..	169	7	27	7	1	46	1,378	1,187	1,206	2,393	..	..	..	..	..	..
	Urban areas total ..	518	8	56	13	4	90	4,412	3,515	3,464	6,979	..	..	..	..	..	..
Tirunelveli district.																	
169	M.T.C. Tirunelveli ..	536	10	16	1	3	45	1,211	993	1,120	2,113	..	..	..	..	..	..
170	" " Tirunelveli ..	170	1	5	..	..	7	927	620	713	1,333	..	..	..	..	..	..
171	" " Palyankottai ..	109	2	50	..	..	53	694	518	466	984	..	..	..	..	..	..
172	" " Kanyakumari ..	26	1	3	..	..	6	224	162	147	309	..	..	..	..	..	..
173	" " Shencottah ..	14	..	..	..	..	..	187	142	149	291	..	..	..	..	..	..
	M.T.C. total ..	865	18	74	2	3	111	3,243	2,435	2,595	5,030	..	..	..	..	..	..
174	T.C. Tenkad ..	73	1	16	3	..	20	170	195	235	430	..	..	..	..	..	..
175	" " Kadayasallur ..	41	..	2	2	..	4	146	148	128	276	..	..	..	..	..	..
176	" " Pullyangudi ..	15	..	..	..	..	..	99	67	71	138	..	..	..	..	..	..

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Death rate per 1,000 of estimated mid-year population—cont.														
Serial number.	Districts and towns.	(27) Plague.	(28) Malaria.	(29) Fevers.	(30) Dysentery and diarrhoea.	(31) Respiratory cases.	(32) Injuries.	(33) All other causes*	From all causes.		(36) Number of maternal deaths.	(37) Rate per 1,000 births (live and still).	(38) Number of months for which complete B and D returns have not been received.	
									(34) Total deaths.	(35) Average of published ratio for the previous five years.				
B. TOWNS—cont.														
MUNICIPALITIES AND CENSUS TOWNS—cont.														
Madurai district—cont.														
115	M.T.C. Madurai	..	..	1.36	1.09	2.08	0.25	11.21	14.10	18.79	95	4.01	..	
116	" Dindigul	..	..	2.83	0.70	0.85	0.28	5.78	10.62	11.23	24	0.55	..	
117	" Bodinayakanur	..	..	1.54	1.75	0.68	0.30	5.78	10.62	11.23	13	4.02	..	
118	" Periyakulam	..	0.03	0.37	4.11	3.49	0.47	13.38	22.40	15.96	18	4.48	..	
119	" Palani	..	..	0.14	1.70	3.65	0.44	1.52	13.49	15.94	1	1.94	..	
120	" Kodakanal	..	..	1.42	1.58	6.00	0.08	7.83	10.92	16.46	5	7.33	..	
121	" Cumbum	..	0.03	1.47	1.41	0.32	0.10	4.76	8.08	5.19	151	5.01	..	
	M.T.C. total	..	*	1.48	1.28	1.98	0.27	9.66	14.93	..			..	
Ramanathapuram district—cont.														
122	T. C. Gudalur	..	..	0.76	0.04	0.49	0.09	3.89	5.20	7.56	1	2.75	..	
123	" Thevaram	..	..	4.08	2.00	0.17	0.00	5.92	12.17	13.29	1	3.74	..	
124	" Chinnamanur	..	..	0.74	1.13	0.39	0.00	3.88	6.22	8.36	3	1.09	..	
125	" Thirumangalam	..	..	0.29	2.16	1.78	0.10	6.44	10.77	9.57	3	12.79	..	
126	" Uthamapalayam	..	..	2.44	1.93	3.41	0.37	5.11	13.26	10.74	3	3.58	..	
127	" Allinagar	..	0.04	2.59	1.55	0.38	0.29	3.51	9.45	5.13	3	10.55	..	
128	" Sholavandan	..	..	0.85	0.52	0.07	0.07	4.84	6.27	9.66	3	5.42	..	
129	" Usilampatti	..	0.06	0.86	0.62	0.19	0.10	3.58	5.62	6.09	3	3.14	..	
130	" Andipatti	..	..	0.41	0.31	0.92	0.42	1.73	14.03	15.19	2	2.60	..	
131	" Kombai	..	..	5.63	1.26	1.34	0.03	5.38	8.08	5.75	2	5.66	..	
132	" Battagundu	..	0.08	0.64	0.40	0.20	0.16	4.15	6.80	7.60	1	..	..	
133	" Melur	..	0.05	0.92	0.66	0.83	0.08	6.23	8.92	11.12	1	2.80	..	
134	" Natham	..	..	1.74	1.07	0.83	0.08	5.87	9.59	10.63	1	..	..	
135	" Tiruparankundram	..	..	..	1.45	0.67	0.36	4.88	10.36	11.69	1	5.66	..	
136	" Arakudi	..	0.12	4.58	1.45	0.60	..	3.25	5.41	..	1	..	..	
137	" Eimmalai	..	..	..	..	..	..	5.25	8.00	..	24	3.79	..	
138	" Nilakottai	..	..	..	..	..	..	..	13.17	..	175	4.80	..	
	T.C. total	..	0.02	1.50	0.95	0.78	0.15	4.58	8.00	..	24	3.79	..	
	Urban areas total	..	0.08	1.48	1.20	1.68	0.24	8.47	13.17	..	175	4.80	..	

Ramanathapuram district—cont.

139	M.T.C. Rajapalayam	..	..	2.72	2.12	1.29	..	5.61	11.74	13.51	..	4	1.60	..
140	" Srivilliputhur	..	..	2.07	1.42	0.04	0.11	11.05	15.59	18.30	..	16	0.34	..
141	" Virudhunagar	..	..	1.99	1.31	0.79	0.05	6.30	10.32	12.95	..	1	9.88	..
142	" Karaikudi	..	..	2.65	0.53	0.55	0.17	5.72	12.44	12.04	..	6	5.51	..
143	" Devakottai	..	..	0.23	1.67	1.85	0.18	9.67	18.01	18.24	..	3	9.06	..
144	" Sivakasi	..	..	2.20	1.23	0.82	0.07	5.11	14.57	18.24	..	4	9.33	..
145	" Aruppukottai	..	..	1.55	2.34	1.18	0.18	9.83	14.62	18.24	..	5	3.55	..
146	" Ramanathapuram	..	..	1.86	1.82	0.14	0.34	9.93	14.12	13.21	..	..	..	..
	M.T.C. total	..	..	2.02	1.62	0.94	0.12	7.53	12.34	..	..	44	3.11	..

Tamil Nadu district—cont.

147	T.C. Paramakudi	..	..	1.74	1.13	0.42	..	4.49	7.77	10.79	..	2	1.72	..
148	" Sivagangai	..	..	0.65	0.76	0.71	0.06	4.06	6.35	5.27	..	2	3.37	..
149	" Tirupattur	..	..	3.96	0.85	1.28	0.17	10.18	17.80	18.73	..	12	1.55	..
150	" Tiruppur	..	..	0.33	0.50	0.44	0.17	6.83	7.78	8.61	..	5	8.03	..
151	" Tirunelveli	..	..	1.47	0.95	0.74	0.21	4.21	4.77	4.87	..	..	..	..
152	" Tirupur	..	..	5.31	0.82	1.53	0.31	5.10	13.06	10.88	..	..	..	..
153	" Tirunelveli	..	..	3.14	0.88	0.48	0.10	3.05	7.14	12.11	..	4	15.69	..
154	" Tirunelveli	..	..	2.96	1.85	2.41	0.12	23.52	30.74	22.96	..	1	5.63	..
155	" Tirunelveli	..	..	0.71	0.41	0.41	0.12	4.41	16.06	9.01	..	2	5.36	..
156	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
157	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
158	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
159	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
160	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
161	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
162	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
163	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
164	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
165	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
166	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
167	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
168	" Tirunelveli	..	..	1.00	0.27	0.37	0.09	8.90	10.83	10.90	..	3	11.67	..
	T.C. total	..	..	1.66	0.70	0.68	0.13	5.36	9.65	..	..	31	4.32	..
	Urban areas	..	..	1.88	1.25	0.84	0.15	7.12	11.26	..	..	75	3.52	..

Tamil Nadu district—cont.

169	M.T.C. Tuticorin	..	..	0.47	2.17	4.44	0.37	10.04	17.52	17.79	..	4	9.23	..
170	" Tuticorin	..	..	0.71	1.97	2.00	0.05	10.85	15.61	16.53	..	7	2.07	..
171	" Palayankottai	..	..	0.81	0.81	2.25	1.10	14.34	20.33	23.98	..	51	15.07	..
172	" Palayankottai	..	..	0.80	0.46	0.60	0.30	5.16	7.12	8.88	..	2	5.82	..
173	" Shencottah	..	..	2.94	1.32	0.71	0.30	9.49	14.77	14.77	..	2	2.47	..
	M.T.C. total	..	..	0.96	1.62	2.69	0.35	10.21	15.84	..	..	102	8.09	..
174	T.C. Tenkasi	..	..	2.71	1.60	1.89	0.52	4.39	11.11	9.03	..	26	20.11	..
175	" Kadayannallur	..	..	1.46	0.39	0.89	0.09	3.17	6.00	5.95	..	4	5.16	..
176	" Pallyangudi	..	..	0.51	0.16	0.53	..	3.16	4.41	5.00	..	1	4.16	..

* Less than 0.01.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number	Districts and towns.	Births.			Estimated mid-year population for which birth and death returns are to be received.	Deaths.						
		(4) Males.	(5) Females.	(6) Total.		(7) Birth-rate per thousand of estimated population.	(8) Cholera.	(9) Smallpox.	(10) Plague.	(11) Malaria.	(12) Fevers.	(13) Dysentery and diarrhoea.
B. TOWNS—cont.												
MUNICIPALITIES AND CENSUS TOWNS—cont.												
Tirunelveli district—cont.												
177	T.C. Kalladaiyur	217	160	377	23,700	15.91	..	..	..	..	1	..
178	" Viravanallur	219	210	429	19,000	22.58	..	..	..	..	59	..
179	" Cheranmaadevi	110	118	228	11,100	20.54	..	..	..	..	..	..
180	" Ambasanandram	388	389	777	23,000	33.57	..	..	..	..	..	..
181	" Tiruchendur	448	392	840	15,200	55.28	..	..	..	1	..	..
182	" Sivagiri	149	123	272	13,000	15.11	..	..	..	..	..	..
183	" Udangudi	309	306	615	13,800	44.57	..	..	..	..	..	..
184	" Vandeavanallur	74	47	121	13,600	8.90	..	..	..	..	..	..
185	" Surandai	276	247	523	15,300	32.89	..	..	..	..	..	..
186	" Kulesakarapatnam	94	79	173	10,000	17.30	..	..	..	..	..	..
187	" Kolpatti	25	426	951	36,200	26.27	..	..	..	..	..	..
188	" Srivalkuntam	98	90	188	13,300	14.14	..	..	..	..	..	..
189	" Nanguneri	244	210	454	19,000	45.40	..	..	..	..	..	..
190	" Sankarankoil	203	157	370	26,600	13.91	..	..	..	..	..	..
191	" Tachanallur	120	102	222	10,700	20.75	..	..	..	..	..	..
192	" Ettayapuram	118	91	209	9,800	21.33	..	..	..	..	..	..
193	" Kayalpattam	173	183	356	12,600	28.25	..	..	..	..	..	..
194	" Vikramasingapuram	213	210	423	39,200	10.79	..	..	..	..	..	..
195	" Vadakkuvalliyur	168	144	307	9,400	32.66	..	..	..	..	..	..
196	" Sathankulam	115	113	228	9,900	23.03	..	..	..	..	..	..
197	" Pattanamalai	80	65	145	9,300	15.59	..	..	..	..	..	..
198	" Alwarthirunagar	74	61	135	7,000	19.29	..	..	..	..	..	..
199	" Thiruvanniyallur	370	379	749	13,200	56.74	..	..	..	..	..	..
200	" Kalugumalai	130	124	254	6,200	40.97	..	..	..	..	..	..
201	" Kayathar	79	84	163	5,800	28.10	..	..	..	..	..	..
202	" Kral	101	83	184	5,700	32.26	..	..	..	..	..	..
203	" Kadambur	70	85	155	8,100	19.14	..	..	..	..	..	..
204	" Kalakad	82	79	161	26,800	6.01	..	..	..	..	..	..

205	" Panagudi ..	212	178	390	16,300	23.03	..	..	22	3
206	" Sengapattinam ..	89	79	168	8,700	19.31	..	..	14	1
207	" Arumuganeri ..	17	17	34	25,800	1.32	..	..	1	1
208	" Achampattinam ..	148	135	283	6,400	41.01	..	..	41	15
209	" Semoorvadakara ..	176	200	376	9,400	40.00	..	..	72	44
	T.C. total	7,068	6,446	13,514	606,200	22.29	..	..	1	355
	Total for Urban areas	13,163	12,310	25,473	923,700	27.58	..	..	3	870
Salem district.										
210	M.T.C. Salem ..	5,794	6,056	11,850	270,100	43.87	..	..	38	424
211	" Rasipuram ..	392	316	708	28,100	25.20	..	..	1	28
	M.T.C. total	6,186	6,372	12,558	298,200	42.11	..	..	39	452
212	T.C. Edapadi ..	344	312	656	28,500	23.02	..	..	2	4
213	" Dharmapuri ..	405	409	815	28,800	28.30	..	..	..	3
214	" Komarpalayam ..	302	255	557	12,600	44.21	..	..	..	14
215	" Tiruchengode ..	180	153	333	22,700	14.67	..	..	2	20
216	" Mettur Township ..	440	384	824	44,100	18.73	..	..	..	37
217	" Taramangalam ..	221	162	383	11,700	32.74	..	..	..	20
218	" Attur ..	450	418	868	29,600	29.32	..	..	..	72
219	" Kaveripattinam ..	83	82	165	9,200	17.98	..	..	..	4
220	" Sendamangalam ..	142	118	260	17,000	15.00	..	..	..	9
221	" Harur ..	80	75	155	7,400	20.95	..	..	..	..
222	" Namakkal ..	154	109	263	20,900	12.58	..	..	..	1
223	" Hoar ..	133	123	256	10,800	23.70	..	..	..	11
224	" Jakkandapuram ..	87	79	166	10,300	16.12	..	..	..	2
225	" Krishnagiri ..	352	312	664	24,000	27.25	..	..	..	37
226	" Omalur ..	23	13	36	8,300	4.34	..	..	..	1
227	" Deankottai ..	170	120	290	10,800	26.85	..	..	..	2
228	" Mallasandram ..	98	63	166	12,300	13.51	..	..	1	1
	T.C. total ..	3,856	3,189	6,844	308,900	22.16	..	..	8	133
	Total for urban areas	9,841	9,561	19,402	607,100	31.96	..	..	47	585
Ootacamund district.										
229	M.T.C. Ootacamund ..	7,617	7,468	15,085	260,700	57.88	..	..	..	513
230	" Erode ..	1,879	1,732	3,611	74,500	48.47	..	..	4	44
231	" Tiruppur ..	1,737	1,559	3,296	70,600	46.99	..	..	..	97
232	" Pollachi ..	1,226	1,159	2,385	57,200	41.70	..	..	..	58
233	" Dharmapuri ..	689	661	1,350	27,400	49.27	..	..	..	114
234	" Udumalpet ..	768	734	1,502	28,500	52.70	..	..	..	17
235	" Mettupalayam ..	908	850	1,758	36,600	48.03	..	..	4	28
236	" Gobichettipalayam ..	492	500	992	43,600	22.75	..	..	..	37
237	" Kurichi ..	229	210	439	26,500	16.57	..	..	..	46
	M.T.C. total	15,545	14,878	30,423	625,600	48.62	..	..	8	700

Serial number.	Districts and towns.	Deaths—cont.															Total deaths from all causes.	Cholera. (25)	Smallpox. (26)	Death rate per (estimated) year populat.
		Injuries.																		
		Suicides.		Wounds and accidents.		Snake bite and killed by wild beasts.		Hydrophobia.		Total.		All other causes.		Males. (22)	Females. (23)					
		Males. (15)	Females. (16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)							
U. TOWNS—cont.																				
MUNICIPALITIES AND CENSUS TOWNS—cont.																				
Tirunelveli district—cont.																				
177	T.C. Kalladakurichi ..	88	..	..	..	..	..	..	..	..	..	200	141	148	289	..	..			
178	" Viravanallur ..	14	..	2	..	..	..	..	..	..	..	217	159	172	331	..	..			
179	" Chetannadevi ..	1	..	1	..	..	..	..	..	..	..	179	74	107	181	..	..			
180	" Ambasamundram ..	27	..	5	..	..	..	..	..	..	..	195	145	142	287	..	..			
181	" Tiruchendur ..	26	..	1	..	..	..	..	..	..	..	264	174	160	334	..	..			
182	" Sivagiri ..	32	..	..	..	..	..	..	..	..	..	57	71	55	126	..	..			
183	" Udangudi ..	21	..	..	..	..	..	..	..	..	..	73	73	65	143	..	..			
184	" Vasudevanallur ..	..	..	..	..	..	..	..	..	..	..	65	27	38	65	..	..			
185	" Surandai ..	5	..	..	..	..	..	..	..	..	..	151	118	139	287	..	..			
186	" Kulasekarapatnam ..	..	..	..	..	..	..	..	..	..	..	102	58	71	129	..	0.70			
187	" Kolpatti ..	42	..	3	..	..	..	..	..	..	..	189	152	173	325	..	..			
188	" Srivaikuntam ..	..	..	..	..	..	..	..	..	..	..	88	32	36	88	..	..			
189	" Nanguneri ..	22	..	2	..	..	..	..	..	..	..	148	101	111	212	..	0.15			
190	" Sankarankol ..	..	..	..	..	..	..	..	..	..	..	79	50	40	90	..	..			
191	" Tachanallur ..	..	..	..	..	..	..	..	..	..	..	102	79	83	162	..	..			
192	" Ettayapuram ..	15	..	1	..	..	..	..	..	..	..	103	65	64	129	..	..			
193	" Kayalpattam ..	16	..	..	..	..	..	..	..	..	..	73	70	75	145	..	..			
194	" Vikramasingapuram ..	11	..	1	..	..	..	..	..	..	..	106	89	93	182	..	..			
195	" Vadakkuvallur ..	2	..	3	..	..	..	..	..	..	..	70	75	53	128	..	..			
196	" Sathankulam ..	11	..	..	..	..	..	..	..	..	..	44	41	37	78	..	..			
197	" Pattamadai ..	1	..	..	..	..	..	..	..	..	..	97	44	54	93	..	..			
198	" Alwarthirunagar ..	3	..	..	..	..	..	..	..	..	..	60	38	39	77	..	..			
199	" Thiruvayavillal ..	6	..	1	..	..	..	..	..	..	..	157	82	101	183	..	..			
200	" Kalugumalai ..	9	..	..	..	..	..	..	..	..	..	105	69	74	143	..	..			
201	" Kayathar ..	12	..	1	..	..	..	..	..	..	..	41	41	46	87	..	..			
202	" Eral ..	6	..	..	..	..	..	..	..	..	..	58	54	56	110	..	..			
203	" Kadambur ..	..	..	..	..	..	..	..	..	..	..	98	48	50	98	..	..			
204	" Kalakad ..	9	..	..	..	..	..	..	..	..	..	84	65	59	124	..	..			
Salem district.																				
205	T.C. Panagudi ..	12	..	3	..	..	..	..	..	..	..	187	131	105	236	..	0.12			
206	" Sawayapuram ..	16	..	..	..	..	..	..	..	..	..	32	33	33	66	..	..			
207	" Aranganur ..	7	..	..	..	..	..	..	..	..	..	19	6	16	21	..	..			
208	" Achempuruthur ..	13	..	..	..	..	..	..	..	..	..	113	129	87	181	..	..			
209	" Samboorvadakaral ..	..	..	..	..	..	..	..	..	..	..	110	115	115	244	..	..			
	T.C. total ..	581	27	60	10	3	99	4,090	3,093	3,130	6,223	5,725	11,253	..	..	..	0.02			
	Total for Urban areas ..	1,436	27	124	12	6	210	7,383	5,528	5,725	11,253	..	..	..	..	..	0.01			
Salem district.																				
210	M.T.C. Salem ..	884	31	101	..	5	213	2,271	2,059	2,138	4,197	..	..	..	..	..	0.04			
211	" Badipuram ..	14	..	1	..	..	..	145	118	78	196	..	..	..	..	..	0.03			
	M.T.C. total ..	898	31	102	1	6	215	2,416	2,177	2,216	4,393	..	..	..	..	..	..			
212	T.C. Edapadi ..	17	..	9	..	..	..	..	..	..	..	134	88	78	166	..	..			
213	" Dharmapuri ..	20	..	..	..	..	..	..	..	..	..	118	82	82	164	..	..			
214	" Komarpalayam ..	13	..	..	..	..	..	..	..	..	..	29	42	39	81	..	..			
215	" Tiruchengode ..	7	..	..	..	..	..	..	..	..	..	42	50	59	109	..	..			
216	" Mettur Township ..	22	..	1	..	..	..	..	..	..	..	91	77	71	148	..	..			
217	" Taramangalam ..	..	..	..	..	..	..	..	..	..	..	29	16	13	29	..	..			
218	" Attur ..	6	..	2	..	..	..	..	..	..	..	108	91	104	193	..	..			
219	" Kaveripattinam ..	2	..	..	..	..	..	..	..	..	..	62	32	37	69	..	..			
220	" Sendanangalam ..	13	..	..	..	..	..	..	..	..	..	69	46	63	114	..	..			
221	" Harur ..	..	..	..	..	..	..	..	..	..	..	28	32	18	50	..	..			
222	" Namakkal ..	1	..	4	..	..	..	..	..	..	..	125	82	71	156	..	..			
223	" Hosur ..	3	..	..	..	..	..	..	..	..	..	13	68	52	110	..	..			
224	" Jalakandapuram ..	16	..	2	..	..	..	..	..	..	..	12	11	7	18	..	..			
225	" Krishnagiri ..	..	..	..	..	..	..	..	..	..	..	180	142	126	268	..	..			
226	" Omalur ..	..	..	..	..	..	..	..	..	..	..	95	4	5	9	..	..			
227	" Denkanikottai ..	2	..	..	..	..	..	..	..	..	..	25	27	27	54	..	0.08			
228	" Mallasamundram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
	T.C. total ..	129	7	18	5	..	40	1,250	938	914	1,847	..	..	..	..	..	..			
	Total for Urban areas ..	1,027	41	180	6	6	255	3,666	3,110	3,130	6,240	..	..	..	..	..	0.02			
Coimbatore district.																				
229	M.T.C. Coimbatore ..	784	..	..	..	..	..	..	..	..	..	3,032	2,367	2,198	4,565	..	0.03			
230	" Erode ..	104	..	..	..	..	..	..	..	..	..	718	478	451	929	..	0.01			
231	" Tiruppur ..	143	..	..	..	..	..	..	..	..	..	449	355	352	707	..	..			
232	" Pollachi ..	50	..	..	..	..	..	..	..	..	..	630	414	459	873	..	..			
233	" Dharmapuri ..	41	..	..	..	..	..	..	..	..	..	296	201	174	338	..	0.04			
234	" Mettupalpet ..	28	..	..	..	..	..	..	..	..	..	147	132	154	346	..	..			
235	" Mettupalayam ..	59	..	..	..	..	..	..	..	..	..	240	184	159	323	..	..			
236	" Gobichettipalayam ..	30	..	..	..	..	..	..	..	..	..	83	78	62	140	..	..			
237	" Karichal ..	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
	M.T.C. total ..	1,291	23	200	14	13	271	5,846	4,419	4,177	8,593	..	..	..	..	..	0.01			

* Less than 0.01.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number.	Districts and towns.	Death rate per 1,000 of estimated mid-year population—cont.										Number of months for which returns have not been received.	
		Plague. (27)	Malaria. (28)	Typhoid. (29)	Dysentery and diarrhoea. (30)	Respiratory cases. (31)	Injuries. (32)	All other causes. (33)	From all causes.				
									Total deaths. (34)	Average published ratio for the previous five years. (35)			
B. TOWNS—cont.													
MUNICIPALITIES AND CENSUS TOWNS—cont.													
Tirunelveli district—cont.													
177	T.C. Kalladalkurichi	..	..	0.04	..	3.71	..	8.44	12.19	..	2	5.31	..
178	" Viravanallur	..	..	3.11	2.05	0.74	0.11	11.42	17.42	17.50	5	11.44	..
179	" Seranamadevi	..	..	..	..	0.00	0.00	16.13	16.31	16.33	1	4.35	..
180	" Ambesamudram	..	0.04	1.65	0.75	1.17	0.35	8.48	12.48	13.45	3	3.51	..
181	" Tiruchendur	..	..	2.63	0.07	1.71	0.20	17.37	21.07	13.55	4	4.58	..
182	" Sivagiri	..	..	1.78	0.22	1.73	0.06	3.17	7.00	8.29	1	3.68	..
183	" Udangudi	..	..	3.26	..	1.52	0.29	5.29	10.36	9.58	3	4.72	..
184	" Vasudevavallur	..	..	..	..	..	..	4.78	4.78	7.31	1	8.26	..
185	" Surandai	..	..	7.17	1.01	0.31	0.06	9.50	18.05	15.44	1	1.91	..
186	" Kula-ekapattanam	..	..	2.00	..	..	..	10.20	12.90	18.84	3	17.14	..
187	" Kolpatti	..	..	1.93	0.50	1.16	0.17	5.22	8.98	5.60	8	8.03	..
188	" Srivalkuntam	..	..	..	..	..	..	6.62	6.62	9.19	..	..	..
189	" Nanguneri	..	..	3.30	0.30	2.20	0.60	14.51	21.29	16.70	4	8.37	..
190	" Sankarankoil	..	..	0.15	0.04	0.03	..	2.97	3.38	5.46	..	..	..
191	" Tachanallur	..	..	2.90	0.75	1.73	0.19	9.53	15.14	17.20	1	4.42	..
192	" Ettayapuram	..	..	0.31	0.10	1.53	0.20	11.02	13.16	10.35	..	..	..
193	" Kayalpattam	..	..	2.78	1.35	1.27	0.32	5.79	11.51	12.06	..	..	..
194	" Viokranasingapuram	..	..	0.89	0.74	0.23	0.03	2.70	4.64	7.14	2	4.72	..
195	" Vadakuvalliyur	..	..	4.57	..	0.21	0.43	8.40	18.62	14.35	..	..	..
196	" Sathankulam	..	..	2.02	0.30	1.11	..	4.44	7.83	10.78	1	4.39	..
197	" Pattamadai	..	..	..	..	0.11	..	10.43	10.54	11.01	..	..	..
198	" Alwarthirumagari	..	..	1.86	0.14	0.43	..	8.57	11.00	13.79	..	..	..
199	" Thisayanvilai	..	..	0.68	..	0.45	0.83	11.89	13.86	19.13	6	7.95	..
200	" Kalugumalai	..	..	2.90	1.77	1.45	..	16.94	23.06	22.13	..	..	..
201	" Kayathar	..	..	3.97	1.38	2.07	0.52	7.08	15.00	14.12	..	..	..
202	" Erail	..	..	5.44	3.16	1.05	0.35	9.30	19.30	21.03	2	10.91	..
203	" Kadambur	..	..	..	..	..	..	17.19	17.19	9.22	..	..	..
204	" Kelakad	..	..	1.03	0.07	0.34	..	3.13	4.63	4.86	1	6.91	..
T.C. total													
Total for Urban areas													
Salem district.													
205	T.C. Panagudi	..	..	1.35	0.62	0.74	0.18	11.47	14.43	10.76	..	..	..
206	" Sawarapuram	..	..	1.61	0.34	1.84	0.11	3.68	7.59	10.22	..	..	..
207	" Arumuganeri	..	..	0.04	..	0.04	..	0.74	0.81	1.37	..	..	..
208	" Achenputhur	..	..	5.94	2.17	1.01	0.72	18.38	28.23	..	2	8.53	..
209	" Samboorvadakarai	..	..	7.66	4.68	1.38	0.53	11.70	25.96	..	..	5.19	..
T.C. total													
Total for Urban areas													
Salem district.													
210	M.T.C. Salem	..	0.14	1.32	1.57	3.27	0.79	8.41	15.54	14.77	85	6.64	..
211	" Rasipuram	..	0.04	0.21	1.00	0.50	0.07	5.16	6.98	8.94	..	..	..
M.T.C. total													
T.C. total													
Total for Urban areas													
212	T.C. Edapadi	..	0.07	0.14	0.92	0.60	0.38	4.70	5.82	1.74	1	1.51	..
213	" Dharmapuri	..	..	0.10	0.42	0.69	0.28	4.10	5.69	4.74	..	..	..
214	" Komarpalayam	..	0.24	1.69	1.11	1.03	0.16	2.30	6.43	7.46	..	..	..
215	" Tiruchengode	..	0.09	1.63	0.88	0.31	0.04	1.35	4.80	5.71	1	1.19	..
216	" Mettur Township	..	..	0.29	0.45	0.52	0.02	2.08	3.36	4.51	..	..	..
217	" Taramangalam	..	..	..	..	..	..	2.48	2.48	4.04	3	3.46	..
218	" Attur	..	..	2.47	0.14	0.20	0.14	3.65	7.50	12.25	..	..	..
219	" Kaveripattinam	..	..	0.54	0.53	0.22	..	4.06	6.71	9.10	1	3.92	..
220	" Sandamangalam	..	..	1.35	0.53	0.76	0.27	3.78	7.46	12.14	4	16.21	..
221	" Harur	..	..	2.70	0.05	0.76	0.53	5.98	6.83	13.87	..	..	..
222	" Namakkal	..	..	1.02	0.28	0.23	0.10	8.61	10.19	11.75	..	..	..
223	" Heer	..	..	1.29	1.54	0.67	0.17	7.50	11.17	11.37	..	..	..
224	" Isakkandapuram	..	..	0.28	0.12	0.23	0.12	9.91	1.08	2.01	..	..	..
225	" Krishnagiri	..	..	1.89	0.19	0.28	0.09	9.07	9.91	8.75	..	..	..
226	" Omalur	..	..	..	0.08	0.16	0.08	2.05	4.43	5.48	1	6.02	..
227	" Denkanikota	..	..	..	..	..	..	..	..	..	..	..	..
228	" Mallasamudram	..	..	..	..	..	..	..	..	..	..	..	..
T.C. total													
Total for Urban areas													
Coimbatore district.													
229	M.T.C. Coimbatore	..	0.05	0.20	1.97	3.01	0.59	11.63	17.51	20.02	53	3.34	..
230	" Erode	..	..	0.50	0.50	1.40	0.20	9.64	12.47	13.81	7	1.86	..
231	" Tiruppur	..	..	0.88	0.82	2.08	0.41	6.36	10.01	13.22	9	2.63	..
232	" Pollachi	..	..	1.63	1.93	0.87	0.33	11.01	15.26	17.11	7	2.79	..
233	" Dharmapuri	..	..	0.62	0.38	1.57	0.40	10.80	13.69	13.85	2	4.36	..
234	" Udumalpet	..	0.11	1.37	0.46	0.98	0.63	11.86	11.86	13.83	7	3.27	..
235	" Mettupalayam	..	..	0.97	1.01	0.43	0.52	4.02	10.65	10.65	6	12.86	..
236	" Gobichettipalayam	..	..	..	0.71	0.63	0.05	5.50	7.41	6.86	13	6.80	..
237	" Kurichi	..	..	0.07	0.26	0.83	1.89	3.13	5.28	4.83	8	..	..
M.T.C. total													
Total for Urban areas													

* Less than 0.01.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Serial number.	Districts and towns.	Births.			Deaths.										
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
B. TOWNS—cont.															
MUNICIPALITIES AND CENSUS TOWNS—cont.															
Coimbatore district—cont.															
239	T.C. Kotur	..	..	..	156	117	273	15.51	..	..	..	1	24	10	
240	" Palladam	..	..	..	77	76	153	14.30	..	..	..	..	9	6	
241	" Bhavani	..	..	..	218	197	415	27.67	..	..	..	1	40	15	
242	" Avanashi	..	..	..	112	107	219	22.35	..	..	..	..	22	13	
243	" Vellore	..	..	..	157	176	333	24.66	..	..	..	..	13	2	
244	" Singanailur	..	..	..	103	90	193	7.62	..	..	..	..	11	13	
245	" Satyamangalam	..	..	..	170	183	353	19.14	..	..	..	..	15	10	
246	" Sulur	..	..	..	154	144	298	29.80	..	..	..	4	18	3	
247	" Kaniyamthur	..	..	..	84	72	156	6.87	..	..	..	..	6	3	
248	" Peelamedu	..	..	..	50	53	103	5.63	..	..	..	..	15	5	
249	" Annur	..	..	..	89	93	182	18.76	..	..	..	2	12	9	
249	" Ananais	..	..	..	147	137	284	24.70	..	..	..	..	4	11	
250	" Vettakanpudur	..	..	..	57	69	126	7.41	..	..	..	2	10	2	
	T.C. Total	..	..	..	1,579	1,524	3,103	15.41	..	..	..	10	218	102	
	Total for Urban areas	..	..	..	17,124	16,397	33,521	40.53	1	..	..	18	591	902	
The Nilgiris district.															
251	M.T.C. Ootacamund	..	..	..	1,028	968	1,996	33.31	..	..	..	..	6	10	
252	" Coonoor	..	..	..	663	628	1,291	44.98	..	..	..	..	3	33	
	M.T.C. total	..	..	..	1,691	1,596	3,287	40.63	..	..	..	..	9	118	
Kanyakumari district.															
253	T.C. Kottagiri	..	..	..	227	194	421	27.88	..	..	..	..	18	16	
254	" Wellington	..	..	..	175	154	329	25.50	..	..	..	..	9	2	
	T.C. total	..	..	..	402	348	750	26.79	..	..	..	..	27	18	
	Total for Urban areas	..	..	..	2,093	1,944	4,037	37.10	..	..	..	..	36	136	
Kanyakumari district.															
255	M.T.C. Nagerkoll	..	..	..	1,866	1,729	3,595	34.21	..	..	..	..	107	61	
256	" Colachel	..	..	..	220	185	405	25.80	..	..	..	..	16	20	
257	" Kuzhithurai	..	..	..	217	192	409	32.20	..	..	..	..	13	9	
258	" Padmanabapuram	..	..	..	217	206	423	28.58	..	..	..	..	46	10	
	M.T.C. total	..	..	..	2,520	2,312	4,832	32.58	..	..	..	..	182	103	
259	T.C. Aramboli	..	..	..	177	174	351	43.83	..	..	..	..	26	6	
260	" Boothapandi	..	..	..	149	139	288	38.40	..	..	..	..	15	2	
261	" Kanyakumari	..	..	..	120	122	242	39.67	..	..	..	..	26	12	
262	" Eraniel	..	..	..	309	312	621	65.37	..	..	..	..	29	36	
263	" Kadiappattinam	..	..	..	148	152	300	28.30	..	..	..	..	29	25	
264	" Thiruvithanode	..	..	..	166	143	309	35.93	..	..	..	..	25	12	
265	" Thuthoor	..	..	..	142	124	266	30.93	..	..	..	..	29	21	
266	" Thegappattinam	..	..	..	146	151	297	31.94	..	..	..	..	49	11	
267	" Arumana	..	..	..	189	163	357	35.35	..	..	..	..	35	11	
268	" Kollanode	..	..	..	120	118	238	30.51	..	..	..	..	26	17	
	T.C. total	..	..	..	1,666	1,603	3,269	37.92	..	..	..	..	289	153	
	Total for Urban areas	..	..	..	4,186	3,915	8,101	34.55	..	..	..	..	471	256	
	Grand total (Urban areas)	..	..	..	162,947	153,667	316,614	35.23	7	..	..	132	10,580	12,800	
	Grand total for Rural areas	..	..	..	308,121	280,334	588,455	28.58	13	..	..	505	49,402	19,439	
	Total for the State	..	..	..	466,068	434,001	900,069	26.69	20	..	..	637	59,982	31,739	

STATEMENT No. VI.—Births and deaths from different cases registered in the State of Madras during the year 1960—cont.

Serial number.	Districts and towns.	Deaths—cont.											Death rate per 1,000 of estimated mid-year population.
		Injuries.					Total deaths from all causes.						
		Respiratory diseases. (14)	Males. (15)	Females. (16)	Wounds and accidents. (17)	Snake bite and killed by wild beasts. (18)	Hydrophobia. (19)	Total. (20)	All other causes. (21)	Males. (22)	Females. (23)	Total. (24)	
239	T.C. Kottur	14	..	..	1	3	..	4	60	56	57	113	..
240	" Palladam	16	..	..	..	1	..	1	46	40	38	78	..
241	" Bhavani	12	..	1	3	..	..	4	121	104	98	202	..
242	" Avanashi	7	..	..	1	..	..	1	38	40	41	81	..
243	" Vellalore	14	..	..	1	..	..	1	67	59	38	97	..
244	" Singanailur	8	..	3	5	..	..	8	91	67	74	141	..
245	" Satyamangalam	13	..	2	..	..	..	2	70	59	51	110	..
246	" Suler	2	..	..	..	..	..	..	12	19	20	39	..
247	" Kaniyamuthur	1	..	..	..	..	..	..	31	23	18	41	..
248	" Peelamedu	5	3	..	1	..	..	4	32	35	26	61	..
249	" Annur	14	..	..	..	..	..	..	36	41	32	73	..
250	" Annamalai	4	..	..	..	..	..	..	87	65	41	106	..
	" Vettakanpudur	11	1	1	..	..	..	2	14	23	18	41	..
	T.C. total	121	4	7	12	4	..	27	705	631	552	1,183	..
	Total for urban areas	1,412	27	28	212	18	13	293	6,551	5,050	4,729	9,779	*

* Less than 0.01.

STATEMENT No. VI.—Births and deaths from different causes registered in the State of Madras during the year 1960—cont.

Districts and towns.	Death rate per 1,000 of estimated mid-year population—cont.										Number of months for which complete birth and death returns have not been received.
	Plague.	Malaria.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	Allother causes.	Total deaths.	Average of published ratio for the previous five years.	Number of maternal deaths.	Rate per 1,000 births (live and still).
B. TOWNS—cont.											
MUNICIPALITIES AND CENSUS TOWNS—cont.											
Coimbatore district—cont.											
238 T.C. Kottur	..	0.03	1.36	0.57	0.80	0.23	3.41	6.42	7.57	1	3.06
239 " Palladam	..	..	0.84	0.56	1.50	0.00	4.30	7.29	7.26	..	..
240 " Bhavani	..	0.07	3.27	1.00	0.80	0.27	8.07	13.47	11.84	2	4.07
241 " Avnani	..	..	2.24	1.33	0.71	0.10	3.88	8.27	10.06	..	..
242 " Vellalore	..	..	0.96	0.15	1.04	0.07	4.96	7.19	9.09	1	3.00
243 " Singanailur	..	..	0.81	0.50	0.31	0.01	3.50	5.12	7.84	1	5.05
244 " Sathyamangalam	..	..	0.30	0.53	0.70	..	3.74	5.88	7.17	..	..
245 " Sulur	..	0.40	1.80	0.30	0.20	..	1.20	3.90	4.06	..	..
246 " Kaniamuthur	..	..	0.26	0.13	0.04	..	1.37	1.81	2.64	1	6.41
247 " Pedlamedu	..	..	0.78	0.26	0.26	0.21	1.67	3.18	7.39	3	27.78
248 " Annur	..	0.21	1.24	0.03	1.44	..	3.71	7.53	8.62	..	..
249 " Annamalai	..	..	0.35	0.96	0.35	..	7.57	9.22	8.15	..	..
250 " Vettakanpudur	..	0.12	0.59	0.12	0.65	0.12	0.82	2.41	4.27	..	..
T.C. total	..	0.05	1.08	0.51	0.60	0.13	3.50	5.87	..	9	2.80
Total for urban areas	..	0.02	0.71	1.00	1.71	0.36	7.92	11.82	..	116	3.32
The Nilgiris district.											
251 M.T.C. Ootacamund	..	..	0.12	1.54	4.32	0.35	6.39	12.71	13.42	7	3.41
252 " Coonoor	..	..	0.10	1.32	3.31	0.45	9.62	14.81	15.10	4	3.01
M.T.C. total	..	..	0.11	1.46	3.96	0.38	7.54	13.45	..	11	3.26
Kanyakumari district.											
253 T.C. Kottadri	..	..	1.10	1.06	2.76	0.28	3.11	8.48	10.86	..	..
254 " Wellington	..	..	0.70	0.10	0.62	0.08	3.18	4.73	6.87	..	..
T.C. total	..	..	0.96	0.94	1.79	0.21	3.14	6.75	..	..	..
Total for Urban areas	..	..	0.83	1.25	3.40	0.34	6.41	11.73	..	11	2.95
255 M.T.C. Nagercoil	..	..	1.02	0.61	1.14	0.15	6.39	9.31	..	11	3.04
256 " Colachel	..	..	1.02	1.27	..	0.06	6.43	8.79	..	..	..
257 " Kuthithurai	..	..	1.02	0.71	0.79	0.16	4.88	7.56	..	..	..
258 " Padmanabapuram	..	..	3.11	0.68	0.68	0.34	5.61	10.41	..	8	7.03
M.T.C. total	..	..	1.23	0.69	0.94	0.16	6.19	9.22	..	14	2.87
259 T.C. Aramboli	..	..	3.21	0.74	1.36	0.49	14.57	20.37	..	4	11.05
260 " Boothapandi	..	..	2.00	0.27	0.80	..	8.13	11.20	..	..	..
261 " Kanyakumari	..	..	4.26	1.97	2.13	0.66	10.00	19.02	..	2	8.23
262 " Kaniel	..	..	3.05	3.73	2.11	0.21	24.53	33.68	..	..	..
263 " Kadappattanam	..	..	2.74	2.36	1.51	..	2.26	8.88	..	1	3.32
264 " Thiruvithancode	..	..	2.91	1.40	1.16	0.12	6.16	11.74	..	1	3.15
265 " Thanthur	..	..	3.37	2.44	0.70	..	3.49	10.00	..	..	..
266 " Thengapattinam	..	..	5.27	1.18	0.32	0.32	2.90	10.00	..	1	3.36
267 " Arumaba	..	..	3.47	0.11	1.58	0.30	5.74	19.18	..	5	18.89
268 " Kollanode	..	..	3.33	2.18	0.13	..	5.64	11.28	..	2	8.40
T.C. total	..	..	3.35	1.77	1.18	0.20	8.23	14.73	..	16	4.77
Total for Urban areas	..	..	2.01	1.09	1.03	0.17	6.94	11.25	..	30	3.64
Grand total (Urban areas)	..	0.01	1.18	1.37	2.12	0.25	8.16	13.19	..	1,290	3.92
Grand Total for Rural areas	..	0.02	2.00	0.79	0.87	0.13	7.82	11.72	..	1,875	3.20
Total for the State	..	0.02	1.78	0.94	1.20	0.20	7.92	12.11	..	3,165	3.46

* Less than 0.01.

[illegible][illegible]

• Less than 0.01.

REPORT ON HEALTH CONDITIONS IN MADRAS STATE, 1960

Serial number and Municipal Towns.	Pneumonia.		Pulmonary Tuberculosis.		Diphtheria.		Cerebro spinal fever.		Deaths under one year.		Infant mortality rate per 1000 live births.	
	Deaths.	Rate per mille.	Deaths.	Rate per mille.	Deaths.	Rate per mille.	Deaths.	Rate per mille.	Males.	Females.		
												(10)	(11)	(12)	(13)	(14)	(15)	(16)
Madras district—												
1 Madras ..	..	..	730	0.38	..	..	..	..	4,591	4,241	8,832	121.63
Chingleput district—												
2 Kancheepuram ..	..	..	33	0.35	1	0.01	1	0.01	154	144	298	79.31
3 Tiruvallur ..	257	2.73	21	0.83	2	0.07	..	..	74	62	136	58.30
4 Chingleput ..	90	3.31	..	..	..	..	..	..	30	50	80	79.48
5 Tiruvotiyur ..	..	..	..	..	..	..	..	..	..	..	..	225.99
North Arcot district—												
6 Vellore ..	214	1.55	118	0.85	14	0.10	..	..	424	347	771	116.74
7 Tiruvannamalai ..	46	0.97	47	0.99	..	..	3	0.06	99	94	193	103.20
8 Gudiyatham ..	68	1.18	17	0.29	4	0.07	..	..	164	127	291	136.61
9 Vandiyambadi ..	39	0.86	25	0.55	1	0.02	2	0.04	76	69	145	89.72
10 Tiruppathur ..	25	0.81	5	0.16	1	0.03	..	..	52	44	96	59.18
11 Walajpet ..	..	..	..	..	1	0.07	..	..	24	21	45	55.90
12 Ambur ..	49	1.03	10	0.21	..	..	5	0.10	71	61	131	84.95
13 Arni ..	..	..	26	0.89	..	..	..	..	84	62	146	96.17
14 Arkonam ..	..	..	..	..	..	..	..	..	10	19	29	29.17
15 Arcot ..	..	..	..	..	..	..	..	..	21	13	34	53.54
16 Ranipet ..	15	0.64	..	..	..	..	..	..	33	33	71	70.93
South Arcot district—												
17 Ootdalore ..	48	0.60	40	0.52	2	0.03	..	..	59	85	165	51.11
18 Chidambaram ..	25	0.59	20	0.47	..	..	2	0.04	66	65	131	61.41
19 Villupuram ..	27	0.53	9	0.19	..	..	..	..	49	46	95	49.29
20 Thindivanam ..	28	0.59	14	0.35	..	..	..	..	41	30	71	50.82
Channarayana district—												
21 Thanjavur ..	100	0.77	61	0.47	17	0.13	2	0.02	206	179	385	62.21
22 Kumbakonam ..	61	0.53	53	0.46	4	0.03	..	..	159	123	282	52.72
23 Nagapattinam ..	24	0.38	25	0.40	5	0.08	5	0.08	150	95	248	87.78
24 Mayuram ..	12	0.22	18	0.34	6	0.11	1	0.02	72	62	134	49.12
25 Maanargudi ..	9	0.25	9	0.25	..	..	..	..	74	69	143	67.13
26 Tiruvarur ..	..	..	5	0.16	3	0.09	..	..	40	41	81	55.67
Tiruchirappalli district—												
27 Tiruchirappalli ..	117	0.43	112	0.41	26	0.09	1	0.02	295	238	533	56.72
28 Karaikal ..	17	0.30	24	0.43	3	0.05	..	..	61	67	128	65.87
29 Srirangam ..	32	0.69	4	0.09	1	0.02	..	..	45	39	84	46.00
30 Pudukkottai ..	15	0.23	13	0.24	9	0.17	..	..	84	70	154	60.65
Madurai district—												
31 Madurai ..	634	1.33	264	0.55	31	0.07	17	0.04	964	843	1,807	91.60
32 Dindigul ..	13	0.13	13	0.30	4	0.04	..	..	136	86	222	64.64
33 Bodinayakanur ..	10	0.22	13	0.30	..	..	..	..	47	41	88	73.33
34 Periyakulam ..	98	2.74	19	0.53	3	0.08	..	..	102	82	184	106.41
35 Palani ..	9	0.21	35	0.80	3	0.07	..	..	61	60	121	71.81
36 Kodakkal ..	67	6.54	..	..	1	0.08	..	..	42	25	67	134.06
37 Oombur ..	..	..	..	..	..	..	..	..	35	23	55	85.29
Ramanathapuram district—												
38 Ramanathapuram ..	21	0.23	49	0.66	4	0.05	..	..	95	81	176	73.18
39 Srivilliputhur ..	13	0.39	16	0.47	..	..	..	..	61	67	128	65.87
40 Virudhunagar ..	8	0.14	27	0.47	..	..	..	..	59	53	112	89.80
41 Karakudi ..	1	0.02	11	0.23	..	..	..	..	41	46	87	51.35
42 Devakottai ..	19	0.69	11	0.40	..	..	4	0.15	51	38	89	88.64
43 Sivakasi ..	2	0.07	80	0.47	1	0.04	..	..	40	23	63	67.16
44 Aruppukottai ..	7	0.11	..	..	2	0.03	..	..	75	79	154	91.83
45 Ramanathapuram ..	..	..	..	..	..	..	1	0.03	29	44	73	52.29
Tirunelveli district—												
46 Tirunelveli ..	109	0.90	170	1.41	..	..	..	..	246	229	475	112.88
47 Tirunelveli ..	70	0.82	67	0.78	..	..	..	..	187	162	349	107.71
48 Palarupattinam ..	81	0.64	71	1.47	18	0.37	1	0.02	126	122	248	81.17
49 Melapalayam ..	..	..	23	0.53	1	0.05	..	..	44	33	77	110.00
50 Shencottah ..	1	0.05	4	0.26	1	0.05	..	..	32	21	53	70.10
Salem district—												
51 Salem ..	355	1.31	300	1.11	21	0.08	..	..	339	428	817	98.04
52 Basipuram ..	2	0.07	..	..	..	..	..	..	35	19	54	76.27
Coimbatore district—												
53 Coimbatore ..	302	1.16	116	0.44	34	0.13	1	0.01	696	531	1,277	84.65
54 Erode ..	52	0.70	28	0.38	7	0.09	..	..	110	107	217	60.09
55 Tiruppur ..	75	1.06	17	0.24	..	..	..	..	100	75	185	59.12
56 Pollachi ..	9	0.16	19	0.33	..	..	..	..	100	94	194	81.34
57 Dharmapuri ..	13	0.47	28	1.02	..	..	5	0.18	42	31	73	54.07
58 Gudumalpet ..	5	0.18	..	0.65	23	0.81	..	..	42	41	83	55.25
59 Mettupalayam ..	17	0.46	24	0.65	3	0.08	1	0.03	47	35	82	46.64
60 Gobichettipalayam ..	6	0.14	3	0.07	1	0.02	..	..	35	25	60	60.48
61 Kurichi ..	7	0.26	1	0.04	..	..	..	..	17	14	31	70.61
The Nilgiris district—												
62 Ootacamund ..	147	2.82	19	0.36	7	0.13	..	..	109	95	204	102.20
63 Coonoor ..	25	0.87	7	0.24	2	0.07	..	..	63	53	116	80.85
Kanyakumari district—												
64 Nagercoil ..	13	0.12	42	0.40	2	0.02	3	0.03	63	55	118	32.32
65 Colachel ..	..	..	..	0.71	..	..	..	..	9	11	20	40.36
66 Kuzhithurai ..	..	..	..	..	..	..	..	..	6	7	17	17.11
67 Padmanabapuram ..	..	..	..	..	..	..	..	..	8	13	21	49.04
Total for the State												
	3,466	0.86	2,866	0.44	268	0.04	56	0.01	11,755	10,478	22,233	88.32

* Less than 0.01.

STATEMENT No. VII.—Deaths from cholera registered in the districts in the State of Madras during each month of year 1960.

Serial number.	District.	Number of villages or groups of villages and towns from each of which a monthly return is received.											
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
				Number of villages or groups of villages and towns from each of which a monthly return is received.		January.	February.	March.	April.	May.	June.	July.	August.
1	Madras ..	..	..	1	1	..	..	..	..	..	..	..	..
2	Chingleput ..	..	..	12	2,328	1	..	..	1	..	..	..	..
3	North Arcot ..	..	..	22	2,032	5	..	..	..	..	..	..	..
4	South Arcot ..	..	..	12	2,271	1	..	..	2	..	..	..	..
5	Thanjavur ..	..	..	19	2,435	..	..	1	..	..	..	..	..
6	Tiruchirappalli ..	..	..	14	1,615	1	..	..	..	..	..	..	..
7	Madurai ..	..	..	15	1,075	..	..	..	..	..	..	..	..
8	Ramanathapuram ..	..	..	17	1,536	..	..	..	..	..	..	..	..
9	Tirunelveli ..	..	..	14	1,110	..	..	..	..	..	..	..	..
10	Salem ..	..	..	14	1,614	..	..	..	..	..	..	..	..
11	Coimbatore ..	..	..	18	1,107	..	..	..	..	..	1	5	..
12	The Nilgiris ..	..	..	5	158	..	..	..	..	..	..	..	..
13	Kanyakumari ..	..	..	8	80	..	..	..	..	..	..	..	..
	Total ..	..	171	17,362	17,362	8	..	1	3	..	1	5	..

Serial number.	District.	Ratio of death per 1,000 of estimated mid-year population.											
		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	Average of ratio published for the previous five years.
		September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.		
1	Madras ..	..	..	..	..	..	..	..	..	..	..	0.06	
2	Chingleput ..	..	..	..	..	..	2	2	..	..	..	0.02	
3	North Arcot ..	..	..	..	..	1	4	5	..	..	..	0.01	
4	South Arcot ..	..	..	..	..	2	1	3	..	..	..	0.04	
5	Thanjavur ..	..	..	..	..	1	1	2	..	..	..	0.08	
6	Tiruchirappalli ..	..	1	..	..	..	1	1	..	..	..	0.07	
7	Madurai ..	..	..	..	1	..	1	1	..	..	..	0.02	
8	Ramanathapuram ..	..	..	..	..	..	..	..	..	..	..	0.03	
9	Tirunelveli ..	..	..	..	..	..	..	..	..	..	..	0.05	
10	Salem ..	..	..	..	..	..	..	..	..	..	..	0.02	
11	Coimbatore ..	..	..	..	..	6	..	6	..	..	..	0.02	
12	The Nilgiris ..	..	..	..	..	..	..	..	..	..	..	..	
13	Kanyakumari ..	..	..	..	..	..	..	..	..	..	..	..	
	Total ..	..	1	..	1	10	10	20	..	..	..	0.04	

* Less than 0.01.

STATEMENT No. VIII.—Deaths from small-pox registered in the districts in the State of Madras during each month of the year 1960.

Serial number.	Districts.	Number of circles of registration (talukas and municipalities).												Number of villages or groups of villages of which a monthly return is received.																																							
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)	(39)	(40)	(41)	(42)	(43)	(44)	(45)							
1	Madras ..	..	..	1	1	35	41	53	60	35	34	71	41	35	41	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
2	Chingleput ..	..	..	12	2,328	7	11	28	25	14	13	25	16	20	12	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
3	North Arcot ..	..	..	22	2,032	12	8	11	6	10	15	18	14	8	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
4	South Arcot ..	..	..	12	2,271	11	15	17	25	14	11	23	23	12	17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
5	Thanjavur ..	..	..	19	2,435	23	10	22	28	19	13	7	20	18	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
6	Tiruchirappalli ..	..	..	14	1,615	3	23	13	3	..	2	9	8	4	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
7	Madurai ..	..	..	15	1,075	2	16	18	14	19	2	10	14	14	24	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
8	Ramanathapuram ..	..	..	17	1,536	7	7	2	1	..	2	4	8	12	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
9	Tirunelveli ..	..	..	14	1,110	12	1	4	12	8	7	3	3	12	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
10	Salem ..	..	..	14	1,614	10	4	2	2	17	7	4	3	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
11	Coimbatore ..	..	..	13	1,107	8	2	8	4	11	13	13	9	6	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
12	The Nilgiris ..	..	..	5	158	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
13	Kanyakumari ..	..	..	3	80	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Total		..	..	171	17,362	130	138	178	180	147	119	187	160	143	125	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Serial number	Districts	(15)	(16)	Total		Number of deaths as per ages				Ratio of deaths per 1,000 of estimated mid-year population		Average of ratio published for the previous five years
				Males	Females	Under one year	1-10 years	10 years and above	Total	Males	Females	
1	Madras	..	..	248	273	117	224	180	521	0.25	0.30	0.27
2	Chingleput	..	..	103	95	65	88	45	198	0.10	0.09	0.14
3	North Arcot	..	..	68	66	39	63	32	134	0.04	0.04	0.07
4	South Arcot	..	..	91	88	55	71	53	179	0.06	0.06	0.09
5	Thanjavur	..	..	104	92	51	73	72	196	0.06	0.05	0.08
6	Tiruchireppalli	..	..	35	36	23	27	21	71	0.02	0.02	0.05
7	Madurai	..	..	71	78	33	68	48	149	0.04	0.05	0.04
8	Ramanathapuram	..	..	27	31	18	33	7	58	0.03	0.03	0.06
9	Tirunelveli	..	..	33	45	18	35	25	71	0.03	0.03	0.04
10	Salem	..	..	36	35	26	14	31	78	0.02	0.02	0.03
11	Coimbatore	..	..	43	40	19	39	25	83	0.02	0.02	0.02
12	The Nilgiris	..	..	1	1	1	1	..	2	..	..	0.71
13	Kanyakumari	..	..	..	4	1	..	3	4	..	..	0.39
Total		116	121	860	884	466	736	542	1,744	0.05	0.05	0.08

REPORT ON HEALTH CONDITIONS IN MADRAS STATE, 1960

Serial number.	Districts.		Number of circles of registration (talukas)	(3)	Number of villages or groups of villages or towns from each of which a monthly return is received.	Months.											
	(1)	(2)				(4)	(5)	January.	February.	March.	April.	May.	June.	July.	August.		
(1)																	
1	Madras	..	..	1	1	109	158	131	122	120	103	81	116				
2	Chingleput	..	..	12	2,328	339	188	233	199	306	211	301	273				
3	North Arcot	..	..	22	2,032	993	810	695	629	601	633	689	738				
4	South Arcot	..	..	12	2,271	610	616	513	372	454	474	412	458				
5	Thanjavur	..	..	19	2,435	241	272	227	162	280	257	174	204				
6	Tiruchirappalli	..	..	14	1,615	516	446	297	346	369	412	390	501				
7	Madurai	..	..	15	1,075	553	521	464	434	457	488	326	406				
8	Ramanathapuram	..	..	17	1,536	583	446	407	458	430	446	388	432				
9	Tirunelveli	..	..	14	1,110	491	524	440	457	469	448	454	402				
10	Salem	..	..	14	1,614	600	525	564	537	602	642	510	586				
11	Coimbatore	..	..	18	1,107	389	238	268	361	400	283	282	328				
12	The Nilgiris	..	..	5	158	37	24	49	35	45	45	48	56				
13	Kanyakumari	..	..	8	80	121	130	137	105	154	159	156	150				
	Total	..	..	171	17,362	5,582	4,898	4,425	4,217	4,687	4,601	4,211	4,650				

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Serial number.	Districts.	Total.					Ratio of deaths per 1,000 of estimated mid-year population.					
		September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Average of previous five years.	
		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
1	Madras ..	112	126	136	174	712	766	1,478	0.72	0.83	0.77	1.64
2	Chingleput ..	235	280	308	434	1,694	1,613	3,307	1.58	1.55	1.57	1.96
3	North Arcot ..	624	849	826	1,255	4,651	4,691	9,342	2.95	2.95	2.95	3.34
4	South Arcot ..	434	528	719	636	3,119	3,107	6,226	2.13	2.12	2.12	2.12
5	Tanjavur ..	204	251	270	301	1,368	1,475	2,843	0.81	0.87	0.84	1.13
6	Tiruchirappalli ..	484	489	635	856	2,833	2,908	5,741	1.74	1.77	1.76	2.31
7	Madurai ..	440	449	507	696	2,853	2,888	5,741	1.74	1.76	1.75	1.82
8	Ramanathapuram ..	366	433	545	821	2,826	2,929	5,755	2.73	2.59	2.66	2.98
9	Tirunelveli ..	363	427	541	856	2,881	2,991	5,872	2.19	2.15	2.17	2.11
10	Salem ..	527	573	768	827	3,568	3,693	7,261	1.85	1.93	1.89	2.31
11	Coimbatore ..	291	342	384	518	2,011	2,073	4,084	0.56	1.16	1.14	1.45
12	The Nilgiris ..	26	44	47	47	274	229	503	1.30	1.17	1.24	1.84
13	Kanyakumari ..	129	149	200	239	898	931	1,829	1.83	1.96	1.89	1.34
	Total	4,235	4,940	5,876	7,660	29,688	30,294	59,982	1.76	1.79	1.78	2.28

STATEMENT No. IX.A.—Deaths from malaria registered in the districts in the State of Madras during each month of the year 1960.

Serial number	Districts.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
				Number of circles of registration (talukas and municipalities).	Number of villages or towns from each of which a monthly return is received.	January.	February.	March.	April.	May.	June.	July.	August.
1	Madras ..	..	..	1	1	..	..	..	1	..	..	..	..
2	Chingleput ..	..	..	12	2,328	7	1	..	9	12	3	4	5
3	North Arcot ..	..	..	22	2,032	34	3	1	7	2	2	8	8
4	South Arcot ..	..	..	12	2,271	..	1	..	5	..	1	..	6
5	Thanjavur ..	..	..	19	2,435	2	..	8	7	..	..	3	..
6	Tiruchirappalli ..	..	..	14	1,615	5	..	7	11	6	12	7	6
7	Madurai ..	..	..	15	1,075	7	..	7	5	2	..	11	1
8	Ramanathapuram ..	..	..	17	1,536	8	3	11	7	2	8	8	7
9	Tirunelveli ..	..	..	14	1,110	..	..	..	1	1	1	1	1
10	Salem ..	..	..	14	1,614	5	4	5	8	8	4	9	8
11	Coimbatore ..	..	..	18	1,107	11	3	10	7	22	4	3	5
12	The Nilgiris ..	..	..	5	158	..	1	..	..	..	3	..	..
13	Kanyakumari ..	..	..	8	80	..	..	..	..	..	..	..	..
	Total ..	..	171	17,362	..	79	16	49	68	55	38	54	47

Serial number	Districts.	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
		October.	November.	December.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Average ratio published for the previous five years.
1	Madras ..	1	..	2	3	..	4	4	..	*	*	0.02
2	Chingleput ..	12	1	10	23	35	35	70	0.03	0.03	0.03	0.04
3	North Arcot ..	5	8	5	18	40	54	94	0.03	0.03	0.03	0.04
4	South Arcot ..	2	..	..	2	9	11	20	0.01	0.01	0.01	0.01
5	Thanjavur ..	..	1	..	1	10	11	21	0.01	0.01	0.01	0.02
6	Tiruchirappalli ..	3	1	..	4	31	30	61	0.02	0.02	0.02	0.03
7	Madurai ..	2	7	3	12	28	19	47	0.02	0.01	0.01	0.02
8	Ramanathapuram ..	14	2	9	25	36	44	80	0.03	0.04	0.04	0.02
9	Tirunelveli ..	..	..	..	..	4	2	6	*	*	*	0.02
10	Salem ..	22	18	28	68	79	60	139	0.04	0.03	0.04	0.10
11	Coimbatore ..	10	2	4	16	42	46	88	0.02	0.03	0.02	0.03
12	The Nilgiris ..	..	..	1	1	2	3	5	0.01	0.01	0.01	0.04
13	Kanyakumari ..	..	..	2	2	1	1	2	*	*	*	*
	Total ..	71	40	69	180	317	320	637	0.02	0.02	0.02	0.04

* Less than 0.01.

STATEMENT No. X.—Deaths from dysentery and diarrhoea registered in the districts in the State of Madras during each month of the year 1960.

Serial number.	Districts.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
				Number of stools of registration (values and municipalities).	Number of villages or towns from each of which a monthly return is received.	January.	February.	March.	April.	May.	June.	July.	August.
1	Madras ..	..	..	1	1	414	439	327	240	295	308	357	407
2	Chingleput ..	..	..	12	2,328	275	207	135	104	171	216	211	259
3	North Arcot ..	..	..	22	2,032	823	438	268	296	288	242	331	485
4	South Arcot ..	..	..	12	2,271	307	205	176	139	144	183	195	192
5	Thanjavur ..	..	..	19	2,435	119	108	129	113	78	69	105	87
6	Tiruchirappalli ..	..	..	14	1,615	177	123	225	154	194	184	146	185
7	Madurai ..	..	..	15	1,075	278	238	255	184	185	206	213	199
8	Ramanathapuram ..	..	..	17	1,536	218	182	164	173	175	160	96	92
9	Tirunelveli ..	..	..	14	1,110	257	178	117	158	122	150	134	135
10	Salem ..	..	..	14	1,614	241	178	140	183	200	132	162	178
11	Coimbatore ..	..	..	18	1,107	164	143	156	176	201	254	204	271
12	The Nilgiris ..	..	..	5	158	13	19	27	42	38	24	17	13
13	Kanyakumari ..	..	..	8	80	64	74	82	67	74	105	101	107
	Total ..	171	17,362	2,582	2,201	2,029	2,185	2,272	2,610	2,272	2,272	2,272	2,610

Serial number.	Districts.	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
		September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.	Average ratio published for the previous five years.
1	Madras ..	..	..	..	..	2,361	2,370	4,731	2,38	2,57	2,47	2.94
2	Chingleput ..	..	..	..	..	1,209	1,200	2,409	1.13	1.15	1.14	1.18
3	North Arcot ..	..	..	..	..	2,760	2,923	5,683	1.75	1.84	1.79	1.72
4	South Arcot ..	..	..	..	..	1,410	1,325	2,735	0.96	0.90	0.93	1.07
5	Thanjavur ..	..	..	..	..	581	623	1,204	0.35	0.37	0.36	0.53
6	Tiruchirappalli ..	..	..	..	..	1,031	1,075	2,136	0.65	0.66	0.65	0.82
7	Madurai ..	..	..	..	..	1,349	1,374	2,723	0.82	0.84	0.83	0.78
8	Ramanathapuram ..	..	..	..	..	912	984	1,896	0.88	0.87	0.88	0.91
9	Tirunelveli ..	..	..	..	..	1,040	1,159	2,199	0.79	0.83	0.81	0.87
10	Salem ..	..	..	..	..	1,062	1,124	2,186	0.55	0.59	0.57	0.53
11	Coimbatore ..	..	..	..	..	1,187	1,303	2,490	0.66	0.73	0.69	0.84
12	The Nilgiris ..	..	..	..	..	130	126	256	0.62	0.65	0.63	0.64
13	Kanyakumari ..	..	..	..	..	499	592	1,091	1.02	1.24	1.13	0.78
	Total ..	2,178	2,279	3,071	4,769	15,561	16,178	31,739	0.92	0.96	0.94	1.21

STATEMENT No. XI.—Deaths from respiratory diseases registered in the districts in the State of Madras during each month of the year 1960.

Serial number.	Districts.	(2)	(3) Number of circles of registration (Talukas and municipalities).	(4) Number of villages or groups of villages and towns from each of which a monthly return is received.	(5) January.	(6) February.	(7) March.	(8) April.	(9) May.	(10) June.	(11) July.	(12) August.
1	Madras ..	..	1	1	676	899	757	579	715	669	605	722
2	Chingleput ..	..	12	2,328	262	378	297	420	218	178	238	186
3	North Arcot ..	..	22	2,032	410	377	303	285	295	317	353	338
4	South Arcot ..	..	12	2,271	230	240	185	172	204	176	211	176
5	Thanjavur ..	..	19	2,435	206	149	179	150	122	125	109	128
6	Tiruchireppalli ..	..	14	1,615	200	196	174	168	172	191	200	208
7	Madurai ..	..	15	1,075	407	387	339	366	364	330	306	336
8	Ramanathapuram ..	..	17	1,536	225	208	207	188	166	167	151	139
9	Tirunelveli ..	..	14	1,110	300	275	282	262	264	215	229	208
10	Salem ..	..	14	1,614	238	202	196	219	296	222	216	247
11	Coimbatore ..	..	18	1,107	287	372	379	430	290	284	279	284
12	The Nilgiris ..	..	5	158	32	41	55	67	49	53	61	56
13	Kanyakumari ..	..	8	80	70	49	65	67	95	80	62	74
Total ..		171	17,362	3,543	3,773	3,418	3,433	3,250	3,007	3,020	3,102	3,102

Serial number.	Districts.	(13) September.	(14) October.	(15) November.	(16) December.	Total.			Ratio of deaths per 1,000 or estimated mid-year population.			Average of the ratio published for the previous five years.
						(17) Males.	(18) Females.	(19) Total.	(20) Males.	(21) Females.	(22) Total.	
1	Madras ..	..	..	..	..	4,502	4,216	8,718	4.53	4.58	4.55	4.99
2	Chingleput ..	..	..	..	..	1,647	1,342	2,989	1.54	1.29	1.42	1.55
3	North Arcot ..	..	..	..	..	2,270	1,870	4,140	1.44	1.17	1.31	1.37
4	South Arcot ..	..	..	..	..	1,306	1,205	2,511	0.89	0.82	0.86	0.97
5	Thanjavur ..	..	..	..	..	985	779	1,764	0.59	0.46	0.52	0.67
6	Tiruchireppalli ..	..	..	..	..	1,263	1,114	2,377	0.77	0.68	0.73	0.98
7	Madurai ..	..	..	..	..	2,272	2,140	4,412	1.39	1.30	1.34	1.66
8	Ramanathapuram ..	..	..	..	..	1,145	947	2,092	1.11	0.84	0.97	1.22
9	Tirunelveli ..	..	..	..	..	1,631	1,530	3,161	1.24	1.10	1.17	1.26
10	Salem ..	..	..	..	..	1,464	1,393	2,857	0.76	0.73	0.74	0.78
11	Coimbatore ..	..	..	..	..	2,193	1,911	4,104	1.22	1.07	1.14	1.28
12	The Nilgiris, The ..	..	..	..	..	356	265	621	1.69	1.36	1.53	1.93
13	Kanyakumari ..	..	..	..	..	500	366	866	1.02	0.77	0.90	0.75
Total ..		2,874	3,255	3,631	4,306	21,534	19,078	40,612	1.28	1.13	1.20	1.37

STATEMENT No. XII.—Deaths from plague registered in the districts in the State of Madras during each month of the year 1960.

Serial number.	Districts.	(1)	(2)	(3)	(4)	Ratio of deaths per 1,000 of estimated mid-year population.												(23)			
						Total.						Average of the ratio published for the previous five years.									
						January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	
						(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	
1	Madras ..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
2	Chingleput ..	..	..	12	2,328	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
3	North Arcot ..	..	..	22	2,032	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
4	South Arcot ..	..	..	12	2,271	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
5	Thanjavur ..	..	..	19	2,435	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Tiruchirappalli ..	..	..	14	1,615	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
7	Madurai ..	..	..	16	1,075	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
8	Ramanathapuram ..	..	..	17	1,586	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
9	Tirunelveli ..	..	..	14	1,110	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
10	Salem ..	..	..	14	1,614	..	..	4	..	..	2	..	..	..	4	3	1	7	7	14†	..
11	Coimbatore ..	..	..	38	1,107	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
12	The Nilgiris ..	..	..	5	158	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
13	Kanyakumari ..	..	..	8	81	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total for the State	..	..	171	17,362	..	..	4	..	..	..	2	..	..	4	3	1	7	7	14†	..

* Less than 0·01.
† Reported by the District Health Officer.

* Less than 0.01.

† Reported by the District Health Officer.

STATEMENT No. XIII.

REPORT ON HEALTH CONDITIONS IN MADRAS STATE, 1960

REPORT ON HEALTH CONDITIONS IN MADRAS STATE, 1960

Serial number and name of municipalities.	Mid-year population for 1960, estimated.	Total number of persons vaccinated.			Primary vaccination.							Total number of operations.	Total of all ages.	Unsuccessful.	Unknown.	
		Males.	Females.	Total.	Successful.				0-1 year.	1-5 years.	5-10 years.					10 and above.
					(7)	(8)	(9)	(10)								
1 Madras ..	1,015,000	237,486	234,719	472,205	54,062	38,173	15,510	910	18	54,611	12	39	17	17	39	
2 Kancheepuram ..	61,800	27,936	27,936	55,872	4,328	2,902	1,347	79	13	4,328	13	17	17	17	17	
3 Tiruvellore ..	24,600	10,042	8,878	18,920	1,443	902	1,880	128	139	1,319	50	46	281	281	281	
4 Chingleput ..	27,200	10,042	8,878	18,920	1,443	902	1,880	128	139	1,319	50	46	281	281	281	
5 Tiruvotiyur ..	30,800	12,630	10,042	22,672	1,443	902	1,880	128	139	1,319	50	46	281	281	281	
6 Vellore ..	338,200	126,111	100,042	226,153	15,092	9,007	3,007	88	15	15,092	2	2	420	420	420	
7 Tiruvannamalai ..	47,400	19,550	16,000	35,550	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
8 Gudiyatham ..	57,600	23,000	19,000	42,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
9 Vaniyambadi ..	45,600	19,000	16,000	35,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
10 Tirupathur ..	80,700	32,000	26,000	58,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
11 Walajpet ..	47,000	19,000	16,000	35,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
12 Ambur ..	29,100	12,000	10,000	22,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
13 Arni ..	29,100	12,000	10,000	22,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
14 Arkonam ..	29,100	12,000	10,000	22,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
15 Raniwet ..	29,100	12,000	10,000	22,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
16 Arcot ..	29,100	12,000	10,000	22,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
17 Cuddalore ..	77,000	32,000	26,000	58,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
18 Chidambaram ..	42,700	17,000	14,000	31,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
19 Villupuram ..	46,800	19,000	16,000	35,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
20 Thiruvannam ..	40,400	16,000	13,000	29,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
21 Thiruvannam ..	130,600	55,000	45,000	100,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
22 Kumbakonam ..	114,600	48,000	40,000	88,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
23 Nagapattinam ..	62,400	25,000	20,000	45,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
24 Mayuram ..	53,500	22,000	18,000	40,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
25 Manargudi ..	36,000	15,000	12,000	27,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
26 Tiruvannam ..	31,000	13,000	10,000	23,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
27 Tiruchirappalli ..	274,800	110,000	90,000	200,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
28 Karur ..	56,800	23,000	19,000	42,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
29 Srirangam ..	46,800	19,000	16,000	35,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
30 Pudukottai ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
31 Madurai ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
32 Dindigul ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
33 Bodinayakanur ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
34 Perakulam ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
35 Palani ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
36 Kodakandam ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
37 Rumbur ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
38 Rameswaram ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
39 Srirangapatnam ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
40 Tiruchirappalli ..	49,000	20,000	16,000	36,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
41 Karaikal ..	47,400	19,000	16,000	35,000	3,242	2,000	1,242	39	39	3,242	89	89	111	111	111	
Grand total ..	6,230,000	2,310,000	1,920,000	4,230,000	228,731	139,906	66,813	8,672	480	215,821	4,820	8,590	215,821	4,820	8,590	

Serial number and name of municipalities.

Serial number and name of municipalities.	Primary vaccination—co. t.				Revaccination.		Percentage of successful cases in which the results were known (17+20)	Total number of successful operations (11+17)	Total number of persons vaccinated.	
	(14) Number of cases in which the results were known	(15) Percentage of successful cases in which the results were known	(16) Total number of operations	(17) Successful of all ages	(18) Unsuccessful	(19) Unknown			(20) Number of cases in which the results were known (16+19)	(21) Percentage of successful cases in which the results were known (17+20)
1 Madras	54,623	99.98	417,555	16,457	313,779	87,319	230,236	71,068	54,660	41,755
2 Kancheepuram	4,298	100.0	118,504	12,553	96,030	10,912	107,392	16,881	4,227	11,654
3 Tiruvallur	98,33	98.33	118,504	2,042	96,369	346	6,001	2,439	427	6,427
4 Chingleput	1,050	99.43	17,030	2,889	14,990	1,201	15,879	1,942	1,082	1,780
5 Tiruvotiyur	1,020	99.39	6,437	1,671	2,517	1,930	4,488	37.23	1,082	6,427
6 Vellore	4,872	99.94	48,388	5,808	39,888	8,092	39,036	10,673	5,209	48,388
7 Tiruvannamalai	1,677	100.0	30,765	370	29,888	507	30,258	2,347	1,977	30,765
8 Gudiyannam	2,504	98.45	9,290	196	8,669	364	8,965	2,011	2,537	9,226
9 Gudiyannam	1,715	98.53	8,918	892	4,035	313	4,348	2,496	1,766	6,260
10 Tirupattur	1,536	100.0	3,818	609	3,245	44	3,289	2,145	1,630	3,800
11 Walajpet	1,838	97.60	2,640	253	1,699	44	1,743	519	1,916	2,640
12 Ambur	1,536	100.0	4,927	784	3,656	487	4,440	1,728	1,916	2,640
13 Arni	564	95.84	2,956	234	1,246	776	1,450	962	673	2,956
14 Arkonam	732	99.45	8,933	234	5,426	413	5,660	1,171	1,171	8,036
15 Rampet	921	99.45	8,933	234	1,509	2,785	2,785	1,327	1,171	8,036
16 Arcot	3,814	99.45	15,436	2,920	10,314	2,902	12,834	5,834	3,814	15,436
17 Chidambaram	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
18 Chidambaram	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
19 Tiruvannamalai	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
20 Tiruvannamalai	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
21 Thanjavur	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
22 Kumbakonam	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
23 Nagapattinam	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
24 Mayuram	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
25 Mannargudi	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
26 Tiruvallur	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
27 Tiruchirappalli	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
28 Srirangam	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
29 Pudukottai	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
30 Madurai	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
31 Dindigul	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
32 Bodinayakanur	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
33 Perakulam	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
34 Palani	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
35 Kodakand	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
36 Cumbam	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
37 Rajapalayam	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
38 Sivakasi	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
39 Tirupattur	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
40 Krishnagiri	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
41 Padmanabapuram	1,614	99.50	27,480	5,143	14,007	8,910	10,150	6,719	1,702	15,436
42 Devakottai	641	97.35	6,196	673	5,621	502	5,694	1,207	626	6,196
43 Sivakasi	908	95.35	1,798	214	1,584	844	1,798	1,075	894	1,798
44 Aruppukottai	1,414	98.80	7,008	707	5,307	844	6,164	2,194	1,426	7,008
45 Ramnathapuram	1,519	98.88	14,088	615	13,867	11,688	2,600	1,934	1,740	14,088
46 Tiruchirappalli	2,781	98.68	23,046	6,341	18,679	3,066	20,020	10,072	3,010	23,046
47 Tiruvallur	2,639	97.39	10,218	1,071	14,641	3,506	15,712	8,641	2,718	19,218
48 Palayamkottai	1,700	98.00	9,802	2,781	5,009	1,412	8,390	4,447	1,770	9,802
49 Palayamkottai	683	100.0	5,320	214	4,767	339	4,981	967	731	5,320
50 Shencottah	541	99.76	1,488	182	1,306	488	1,400	712	501	1,488
51 Salem	11,979	99.84	54,042	4,631	47,080	2,381	51,711	16,591	11,993	54,042
52 Salem	556	83.09	2,435	239	1,809	537	2,068	691	664	2,635
53 Ramanathapuram	7,940	98.77	69,446	4,933	65,514	8,599	60,447	12,775	8,265	69,446
54 Erode	5,206	95.45	26,413	445	24,325	1,683	24,830	3,505	3,262	26,413
55 Tiruppur	2,712	99.82	11,836	308	10,413	1,115	10,721	3,015	2,821	11,836
56 Tiruppur	3,512	100.0	10,265	1,186	8,422	1,657	9,608	3,098	2,512	10,265
57 Pollachi	1,157	96.80	3,649	114	3,421	211	3,488	1,134	1,159	3,649
58 Tirupattur	1,177	100.0	3,887	932	2,636	319	3,568	2,109	1,194	3,887
59 Tirupattur	1,440	98.54	6,461	510	5,080	871	5,590	1,939	1,516	6,461
60 Gobletpalayam	887	100.0	2,617	319	1,982	316	2,301	1,206	931	2,617
61 Kurnool	1,831	100.0	5,665	670	4,120	575	4,790	2,501	1,831	5,665
62 Ootacamund	729	98.49	4,070	177	3,099	794	3,276	895	940	4,070
63 Coonoor	7,010	94.89	16,595	6,748	4,483	5,364	11,231	13,430	6,213	16,595
64 Rasetoil	531	100.0	2,922	2,442	310	170	2,752	2,973	531	2,922
65 Rasetoil	94	95.74	1,785	166	188	1,441	341	246	97	1,785
66 Krishnagiri	462	89.39	3,777	1,798	1,456	523	3,254	2,111	505	3,777
67 Padmanabapuram	220,141	98.04	1,589,347	123,177	1,209,682	259,468	1,332,859	332,998	220,208	1,589,310
Grand total	220,141	98.04	1,589,347	123,177	1,209,682	259,468	1,332,859	332,998	220,208	1,589,310

Statement showing the particulars of vaccination in the Madras State for 1960.

Serial number and name of district (exclusive of Municipal towns.)	(1)	Total number of persons vaccinated.			Total number of operations.	Successful.					Unsuccessful.	Result unknown.	
		Total.				0-1 year.	1-5 years.	5-10 years.	10 years and above.	Total successful.			
		Males.	Females.	Total.									
(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)		
1 Otingoleput	..	1,938,000	121,355	101,314	222,699	37,450	13,353	13,860	1,599	56	28,773	1,263	7,314
2 North Arcot	..	2,678,000	240,881	214,953	455,834	97,732	52,805	18,941	2,134	55	73,935	3,814	20,048
3 South Arcot	..	2,727,000	296,065	269,390	565,355	112,199	43,084	30,510	2,059	264	75,917	7,085	29,197
4 Thanjavur	..	2,945,000	230,540	203,260	435,800	88,794	25,717	26,654	4,797	367	57,175	6,423	24,896
5 Tiruchirappalli	..	2,840,000	212,952	183,716	396,668	99,031	35,445	23,249	4,472	296	63,462	4,739	27,850
6 Madurai	..	2,541,000	267,206	227,855	495,061	88,953	41,756	19,566	1,697	243	63,262	3,947	21,744
7 Ramanathapuram	..	1,793,000	168,615	145,785	314,400	74,204	21,675	24,359	1,497	82	47,563	5,492	21,149
8 Tirunelveli	..	2,892,000	110,500	108,871	228,371	57,330	20,405	13,684	2,586	40	36,635	4,499	16,146
9 Salem	..	3,546,000	299,835	239,881	539,716	114,549	35,309	36,103	3,539	20	74,971	6,573	33,060
10 Coimbatore	..	2,961,000	257,090	197,704	454,794	112,919	37,030	40,451	6,603	182	84,266	4,224	24,429
11 Nilgiris, The	..	326,000	33,081	65,893	11,619	11,619	3,704	4,712	849	159	9,424	445	1,750
12 Kanyakumari	..	818,000	96,866	119,127	215,493	33,042	8,776	14,166	4,312	..	27,254	2,982	3,406
Total for districts	..	27,500,000	2,343,486	2,096,598	4,440,034	925,502	339,064	266,225	36,084	1,714	643,087	51,491	230,924
Total for the Municipalities	..	6,230,000	931,090	884,437	1,815,527	223,731	139,906	66,813	8,672	430	215,821	4,720	8,490
Poonamallee Health Unit	..	..	6,393	4,670	11,063	2,711	1,461	722	31	2	2,216	87	408
Railways	..	..	14,683	7,574	22,257	2,114	873	1,036	103	5	2,017	30	67
By Medical Subordinates and Port Health Officers.	..	..	49,642	9,318	53,960	3,857	959	1,776	485	7	3,227	171	419
Total for the State	..	33,729,000	3,345,294	3,002,597	6,347,891	1,162,915	482,263	336,372	45,375	2,153	868,368	56,099	240,418

Primary vaccinations

Serial number and name of district (exclusive of Municipal towns.)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
1 Otingoleput	..	30,136	95-80	184,388	16,856	95,570	111,926	14-61	45,229	38,536	184,163
2 North Arcot	..	77,749	95-09	358,777	33,726	198,657	232,383	14-51	107,661	97,057	358,777
3 South Arcot	..	83,002	91-46	454,296	28,529	244,770	278,299	10-44	104,446	111,059	454,296
4 Thanjavur	..	63,898	88-38	348,892	19,017	190,694	209,711	9-07	76,492	87,508	348,892
5 Tiruchirappalli	..	68,201	92-05	303,975	25,487	143,536	169,023	15-08	88,949	92,693	303,975
6 Madurai	..	67,209	94-13	408,713	32,749	229,955	262,704	12-47	96,011	86,348	408,713
7 Ramanathapuram	..	53,055	89-65	241,754	26,419	120,545	146,984	17-98	73,982	72,616	241,754
8 Tirunelveli	..	41,134	89-08	176,521	9,184	91,899	100,383	9-10	45,569	51,850	176,521
9 Salem	..	81,649	91-93	475,340	31,752	244,094	275,846	11-51	106,723	114,376	475,340
10 Coimbatore	..	88,490	95-23	342,076	28,785	183,727	212,462	13-52	113,001	112,718	342,076
11 Nilgiris, The	..	9,869	95-49	54,274	5,073	38,736	43,809	11-53	14,497	11,619	54,274
12 Kanyakumari	..	30,236	90-14	183,613	18,991	117,831	136,922	13-88	46,245	32,422	183,613
Total for districts	..	694,578	92-69	3,532,044	276,018	1,899,814	2,175,832	12-69	919,105	908,802	3,532,044
Total for Municipalities	..	220,141	98-04	1,589,347	123,177	1,209,682	1,332,859	9-24	338,998	226,208	1,589,347
Poonamallee Health Unit	..	2,302	99-22	8,423	1,023	5,257	6,280	19-27	3,239	2,640	8,423
Railways	..	2,047	98-55	20,143	3,420	14,636	18,055	18-94	5,437	2,114	20,143
By Medical Subordinates and Port Health Officers.	..	3,395	94-97	55,121	29,220	19,985	49,205	59-38	32,447	3,840	55,121
Total for the State	..	922,467	93-92	5,205,078	422,868	3,149,375	3,582,231	12-03	1,299,225	1,143,604	5,205,078

Serial number and name of district
(exclusive of Municipal towns.)

Serial number and name of district (exclusive of Municipal towns.)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
1 Otingoleput	..	30,136	95-80	184,388	16,856	95,570	111,926	14-61	45,229	38,536	184,163
2 North Arcot	..	77,749	95-09	358,777	33,726	198,657	232,383	14-51	107,661	97,057	358,777
3 South Arcot	..	83,002	91-46	454,296	28,529	244,770	278,299	10-44	104,446	111,059	454,296
4 Thanjavur	..	63,898	88-38	348,892	19,017	190,694	209,711	9-07	76,492	87,508	348,892
5 Tiruchirappalli	..	68,201	92-05	303,975	25,487	143,536	169,023	15-08	88,949	92,693	303,975
6 Madurai	..	67,209	94-13	408,713	32,749	229,955	262,704	12-47	96,011	86,348	408,713
7 Ramanathapuram	..	53,055	89-65	241,754	26,419	120,545	146,984	17-98	73,982	72,616	241,754
8 Tirunelveli	..	41,134	89-08	176,521	9,184	91,899	100,383	9-10	45,569	51,850	176,521
9 Salem	..	81,649	91-93	475,340	31,752	244,094	275,846	11-51	106,723	114,376	475,340
10 Coimbatore	..	88,490	95-23	342,076	28,785	183,727	212,462	13-52	113,001	112,718	342,076
11 Nilgiris, The	..	9,869	95-49	54,274	5,073	38,736	43,809	11-53	14,497	11,619	54,274
12 Kanyakumari	..	30,236	90-14	183,613	18,991	117,831	136,922	13-88	46,245	32,422	183,613
Total for districts	..	694,578	92-69	3,532,044	276,018	1,899,814	2,175,832	12-69	919,105	908,802	3,532,044
Total for Municipalities	..	220,141	98-04	1,589,347	123,177	1,209,682	1,332,859	9-24	338,998	226,208	1,589,347
Poonamallee Health Unit	..	2,302	99-22	8,423	1,023	5,257	6,280	19-27	3,239	2,640	8,423
Railways	..	2,047	98-55	20,143	3,420	14,636	18,055	18-94	5,437	2,114	20,143
By Medical Subordinates and Port Health Officers.	..	3,395	94-97	55,121	29,220	19,985	49,205	59-38	32,447	3,840	55,121
Total for the State	..	922,467	93-92	5,205,078	422,868	3,149,375	3,582,231	12-03	1,299,225	1,143,604	5,205,078

Re-vaccination.

Re-vaccination.

Serial number and name of district (exclusive of Municipal towns.)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
1 Otingoleput	..	30,136	95-80	184,388	16,856	95,570	111,926	14-61	45,229	38,536	184,163
2 North Arcot	..	77,749	95-09	358,777	33,726	198,657	232,383	14-51	107,661	97,057	358,777
3 South Arcot	..	83,002	91-46	454,296	28,529	244,770	278,299	10-44	104,446	111,059	454,296
4 Thanjavur	..	63,898	88-38	348,892	19,017	190,694	209,711	9-07	76,492	87,508	348,892
5 Tiruchirappalli	..	68,201	92-05	303,975	25,487	143,536	169,023	15-08	88,949	92,693	303,975
6 Madurai	..	67,209	94-13	408,713	32,749	229,955	262,704	12-47	96,011	86,348	408,713
7 Ramanathapuram	..	53,055	89-65	241,754	26,419	120,545	146,984	17-98	73,982	72,616	241,754
8 Tirunelveli	..	41,134	89-08	176,521	9,184	91,899	100,383	9-10	45,569	51,850	176,521
9 Salem	..	81,649	91-93	475,340	31,752	244,094	275,846	11-51	106,723	114,376	475,340
10 Coimbatore	..	88,490	95-23	342,076	28,785	183,727	212,462	13-52	113,001	112,718	342,076
11 Nilgiris, The	..	9,869	95-49	54,274	5,073	38,736	43,809	11-53	14,497	11,619	54,274
12 Kanyakumari	..	30,236	90-14	183,613	18,991	117,831	136,922	13-88	46,245	32,422	183,613
Total for districts	..	694,578	92-69	3,532,044	276,018	1,899,814	2,175,832	12-69	919,105	908,802	3,532,044
Total for Municipalities	..	220,141	98-04	1,589,347	123,177	1,209,682	1,332,859	9-24	338,998	226,208	1,589,347
Poonamallee Health Unit	..	2,302	99-22	8,423	1,023	5,257	6,280	19-27	3,239	2,640	8,423
Railways	..	2,047	98-55	20,143	3,420	14,636	18,055	18-94	5,437	2,114	20,143
By Medical Subordinates and Port Health Officers.	..	3,395	94-97	55,121	29,220	19,985	49,205	59-38	32,447	3,840	55,121
Total for the State	..	922,467	93-92	5,205,078	422,868	3,149,375	3,582,231	12-03	1,299,225	1,143,604	5,205,078

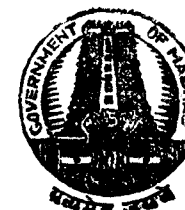
VACCINATION.

Summary of Statement No. XIII.

Agencies.	Total number of persons vaccinated.		Total number of operations.		Percentage of successful cases in which the results were known.		Number of children successfully vaccinated.				Total successful at all ages.
	Primary vaccination.	Re-vaccination.	Primary vaccination.	Re-vaccination.	Primary vaccination.	Re-vaccination.	1-4 Years.	5-9 Years.	10-14 Years.	15-19 Years.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
Districts, (exclusive of Municipal towns) ..	903,802	3,531,282	925,502	3,531,044	92.50	12.69	339,064	206,225	36,034	643,087	
Municipal towns ..	224,203	1,589,319	228,731	1,589,347	98.04	9.24	133,906	66,313	8,672	215,821	
Poonamallee Health Unit ..	2,640	8,423	2,711	8,423	96.22	16.27	1,461	722	31	2,216	
By Medical Subordinates and Port Health Officers ..	3,840	55,120	3,857	55,121	94.97	59.88	959	1,770	485	3,227	
Railways ..	2,114	20,143	2,114	20,143	93.53	18.94	873	1,036	103	2,017	
Total ..	1,143,604	5,204,287	1,162,915	5,203,078	93.92	12.08	432,263	336,572	45,375	806,308	

STATEMENT XIV.—Statement showing the health services in rural and urban areas of the State of Madras during the year 1960.

Districts.	Rural areas (Non-Municipal).												Urban areas (Municipal).											
	Health Officers.						Health Officers.						Health Officers.											
	With public health qualifications.		Without public health qualifications.		Medical Graduates.		Medical Graduates.		Medical Graduates.		Medical Graduates.		With public health qualifications.		Without public health qualifications.		Medical Graduates.		Medical Graduates.		Medical Graduates.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)		
1 Madras ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
2 Chingleput ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
3 North Arcot ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
4 South Arcot ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
5 Thanjavur ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
6 Tiruchirappalli ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
7 Madurai ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
8 Ramanathapuram ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
9 Tirunelveli ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
10 Salem ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
11 Coimbatore ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
12 Nilgiris, The ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
13 Kanyakumari ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..		
Total ..	2	16	3	3	61	60	263	402	10	..	107	13	11	53	33	68	379	3	198	19	8	136		



EDUCATION AND PUBLIC HEALTH DEPARTMENT

(Health.)

G.O. No. 178, 19th January 1962

Public Health—Public Health Administration report for 1960—Reviewed

READ—the following papers :—

From the Director of Public Health, dated 21st July 1961,
R. No. 84588/1/VS/61.

From the Director of Public Health, dated 4th/
21st August 1961, R. No. 138098/23/VS/60.

Order—No. 178, Health, dated 19th January 1962.

Recorded.

2. The registration of births and deaths has been made compulsory throughout the State except in about 40 villages in all in the districts of Tirunelveli, Thanjavur, Tiruchirappalli and the Nilgiris. The vital statistical indices for the year 1960 reveal the following salient features :—

- (a) A decrease in the birth rate from 28.50 in 1959 to 26.7 in 1960.
- (b) A slight increase in the death rate from 11.93 in 1959 to 12.11 in 1960.
- (c) The State was free from plague except a few villages in the Salem district.
- (d) Infant deaths account for 23.2 per cent of the total deaths while the corresponding percentage for old people of 60 and above is 47 per cent, and
- (e) A reduction in the mortality from Malaria and respiratory diseases.

3. Communicable diseases centre—(i) *Cholera*.—The State was practically free from Cholera infection during 1960. The total number of deaths due to Cholera during the year was only 20 as against 206 in 1959.

(ii) *Dysentery and diarrhoea*.—The number of deaths registered under this head in 1960 was 31,739 as against 29,033 in 1959, marking a slight increase in the death rate from 0.87 in 1959 to 0.94 in 1960.

(iii) *Enteric fever*.—There were 544 deaths under this category in the municipal areas as against 486 deaths in 1959.

Small-pox and vaccination.—There were 1,744 deaths due to small-pox during 1960 as against 2,225 in 1959. Madras City continued to record the largest number of deaths (521) accounting for 30 per cent of the total deaths. The Nilgiris and Kanyakumari districts were practically free from infection while as compared with 1959, the increase was less in all the districts except

Madras and Tirunelveli. To cope with the small-pox situation in Madras City, the Director of Public Health was empowered under the Madras Public Health Act, 1939, to inspect control and superintend the operations of the Corporation. A scheme of systematic and intensive vaccination of the entire population of Madras City within a period of 4 months was drawn up for the complete control and eventual eradication of small-pox from the City. During the year, a Pilot Project for eradicating small-pox was initiated in the Chingleput district under the National Small-pox Eradication programme and of the total population of 20 lakhs of the district, a population of 11.56 lakhs was vaccinated.

Plague.—During the year under report, 7 villages in Hosur taluk in Salem district were affected with plague and there were 29 attacks and 14 deaths. The infection was caused by the transport of infested ragi from a neighbouring village in Kolar district in the Mysore State. Necessary anti-plague measures were carried out in all the infected and neighbouring villages.

Fever other than Malaria.—The total number of deaths under this head was 59,982 in 1960 as against 57,572 in 1959 there being a slight increase in the year 1960.

Malaria.—There were 637 deaths due to malaria during the year as against 732 in 1959. The National Malaria Eradication Programme was carried out as scheduled during 1960, the third year of the attack phase.

Filaria.—Filaria control operations were continued by the Public Health Department. Anti-filarial Schemes were carried out by local bodies with financial assistance from the Government. The four National Filaria Control Units established under the National Filaria Control Programme continued to function during the year.

Respiratory diseases.—There was a decrease in the number of deaths under this head from 40,856 in 1959 to 40,612 in 1960. The death rate continued to be higher in the urban areas than in rural areas.

Tuberculosis.—The total number of deaths due to this disease in municipal areas was 2,865 in 1960 as against 3,069 in 1959. During the year, 1,272,770 persons were tuberculin tested of whom 369,880 persons were B.C.G. vaccinated bringing the total number tested to 5,128,144 and the number vaccinated to 1,665,236.

There has been a reduction in the mortality from fevers other than malaria, dysentery and diarrhoea and all other causes. In respect of a large proportion of deaths the cause of death is not known.

Influenza.—During the year, there was no epidemic of influenza. A few mild cases however occurred in some parts of the State.

Leprosy.—During 1960, leprosy survey was conducted by the Health staff and 5,832 cases of leprosy were detected.

Venereal diseases.—The Venereal diseases Control Scheme started by the Madurai Municipality continued to function this year also.

Yaws.—The Government sanctioned a centrally sponsored Yaws Control Scheme in April 1960. Two units were established one at Perundurai and the other at Utthukkuli of Erode taluk, Coimbatore district. These Units examined 62,589 persons and detected 1,425 cases of Yaws.

Guineaworm.—The State-wide Guineaworm Eradication Programme initiated in 1959 was continued during 1960.

4. Health Services Maternity and Child Welfare.—The Maternity and Child Welfare Services in rural areas were further augmented considerably in 1960 by the opening of Maternity and Child Welfare Centres under the Second Five-Year Plan, Backward Areas Scheme, Primary Health Centres and Community Development Programmes. The number of Government Centres has increased from 975 in 1959 to 1,138 centres in 1960. The local bodies maintained 578 centres in 1960 as against 570 in 1959. The number of centres maintained by voluntary agencies also increased from 208 in 1959 to 229 in 1960.

The UNICEF continued their free gift of drugs and diet supplements for distribution in the centres in this State. The total number of infant deaths has decreased from 86,151 in 1959 to 32,439 in 1960.

Industrial Hygiene.—The Health Officers in their capacity as Additional Inspectors of Factories inspected the factories in their areas and their observations were reported to the respective Inspectors of Factories for further action under the "Factories Act".

Residential and industrial areas.—During the year, 20 proposals for exclusion of certain residential areas received from the various local authorities were examined and approved. Nine proposals for setting apart additional industrial areas were scrutinised and approved.

Health, Education and Publicity.—A Health Education Bureau on the lines suggested by the Government of India was established in the State under the over-all charge of an Assistant Director of Public Health by upgrading the Health, Education and Publicity Section in the Office of the Director of Public Health. A State Health Education Council consisting of official and non official members has been constituted to co-ordinate and support the activities of the Health Education Bureau. Health propaganda was carried on in this State through pamphlets, posters, leaflets, by radio broadcast talks, film shows on Health subjects and by participation in exhibitions.

Health Unit, Poonamallee.—This Unit continued to serve as a field training centre for all categories of health workers as in the previous years. The Silver Jubilee of the Unit was celebrated in December 1960 and a health exhibition was held in that connection.

Orientation Training Centre, Poonamallee.—The Centre continues to give training to doctors and auxiliary health personnel in the philosophy of rural health work, and equip them for the better discharge of their duties in the rural health centres. The centre functioned satisfactorily during the year.

5. Food and nutrition.—During the year, the diets of 275 families of different occupational groups were surveyed. A special survey was conducted among the hill tribes in Javadhi Hills in North Arcot district to study their diet pattern. Surveys were also conducted in five institutions, three in urban areas and two in rural areas. Free distribution of gift skim milk from UNICEF was arranged for children and expectant and nursing mothers through Maternity and Child Welfare Centres and Hospitals during the year. The mid-day meals programme by the Government and the Corporation of Madras was continued during the year.

Multivitamin tablets and other food supplements were distributed by the Central Nutrition Bureau to the needy children. Food supplements gifted by the UNICEF were also distributed through the Maternity and Child Welfare Centres to children and mothers towards correcting specific

deficiency signs. Nutrition education was carried on by organising Exhibitions, Film shows, radio talks and by issue of booklets. The Prevention of Food Adulteration Act, 1954 was in force in the State and the provisions of the Act were duly enforced.

6. *Environmental Hygiene*—(i) *Water-supply and drainage*—The progress in the execution of water-supply and drainage schemes was appreciable. Twenty-six water-supply schemes and 7 drainage schemes in urban areas were under various stages of investigation and 27 water-supply and drainage schemes were in different stages of design.

(ii) *Rural and urban sanitation*.—During the year, suitable private and public latrines were provided in a number of cases by persuasion and education and wherever necessary by enforcing the provisions of the Madras Public Health Act.

(iii) *Compost manufacture*.—Sixty-six municipalities and 267 panchayats besides three Township Committees and the Corporation of Madras manufactured compost during the year.

(iv) *Building and Town-planning Schemes*.—A number of town-planning schemes were sanctioned in the local areas and much progress has been made in their execution.

(v) *Fairs and festivals*.—As usual, necessary sanitary arrangements were provided during fairs and festivals and all the festivals passed off without any out-break of any epidemic disease either during or on the wake of festivals.

Training.—One Assistant Director of Public Health underwent a refresher course in modern trends in Public Health Administration at the All-India Institute of Hygiene and Public Health, Calcutta. Two Health Officers were deputed abroad for higher training in Health Education and Preventive and Social Medicine.

Public Health Board.—Two ordinary and one extraordinary meeting of the Public Health Board were held in 1960. The proceedings of these meetings are annexed to the report (Annexure-Y).

General—The Public Health Administration in this State during the year continued to be satisfactory.

(By order of the Governor)

K. SRINIVASAN,
Secretary to Government.

To the Director of Public Health, Madras.

- „ Director of Medical Services, Madras.
- „ Controller of Stationery and Printing (with enclosure—for distribution of copies with reference to G.O. Ms. No. 866, Health, dated 5th March 1956).
- „ Public (Services) Department.
- „ Public (Information and Publicity) Department.
- „ Rural Development and Local Administration Department.
- „ Director-General of Health Services, New Delhi.
- „ Consul for United States of America at Madras.
- „ Secretary to the Government of Andhra Pradesh, Health Department, Hyderabad.
- „ Chief Secretary to Government of Kerala, Trivandrum.
- „ Copy to Rural Development and Local Administration (M-2)

OF THE GOVERNMENT ANALYST.

REPORT OF THE GOVERNMENT ANALYST FOR 1960-61.

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REPORT OF THE GOVERNMENT ANALYST FOR 1960-61.

I. GENERAL.

As in previous years the Government Analysis Department continued to analyse and report on samples of :—

1. Foods received from Food Inspectors in Madras and Andhra States under the Prevention of Food Adulteration Act.
2. Drugs from Drugs-Inspectors in Madras State under the Drugs Act.
3. Diet articles supplied by the contractors to Government Hospitals in Madras State.
4. Drugs supplied to Government Hospitals and Drugs dispensed in Government Hospital, Dispensaries in Madras State.
5. Foods and Miscellaneous products from Central Government Departments such as Railways and State Government Departments such as Jails, Department of Industries and Commerce, etc.
6. Foods, Drugs, Cosmetics and other Commercial products received from the Police Department and from Magistrates under Indian Penal Code, the Prohibition Act, the Poisons Act, the Dangerous Drugs Act, the Drugs and Magic Remedies (Objectionable Advertisements) Act, Trade and Merchandise Marks Act, etc.
7. Miscellaneous products from private sources.

During the year under report, 25,185 samples have been examined and reported on. The number and nature of these samples and their source are given in the Tables in Appendix E.

Consequent on the separation of this Department from the King Institute and its constitution as a unit under the Director of Public Health, this department had heavy additional work of purely administrative nature thrown on it, without any Additional Ministerial Staff. Though representations were made for sanction of the necessary staff there were inevitable delays and as a result, the normal work of the department in sending reports of analysis was thrown out of gear. It was found impossible to prevent during the year a huge accumulation of arrears, in reporting, which got behind Schedule by several months, even though analysis of the samples were complete. This state of affairs has naturally in some cases produced a wrong impression that analysis itself was done several months after receipt of the sample, an impression which had to be dispelled by giving also the date of analysis in the certificates in these cases. It is hoped that the additional staff will be sanctioned soon and the arrears will be cleared up.

Another work which was held up for want of clerical staff, was the collection of analysis fees and annual contribution from local bodies in Andhra Pradesh and Madras States—a work which came to a stand still after the separation of this Department from the King Institute. Action in this matter will be taken immediately after additional staff are appointed.

From 28th May, till 26th September 1960, Sri K. R. Srinivasan, a Government Analyst was on leave, and during this period, Sri K. Narayana-swamy was in charge of the duties of the Government Analyst.

The Deputy Government Analyst—attended the meeting of the Analyst's Sub-Committee, the Seminar on Prevention of Food Adulteration and the meeting of the Central Committee for Food Standards held in Hyderabad in November, 1960. The Central Committee among other things accepted the recommendations of the permanent Sub-Committee of Analysts that the maximum number of assorted samples examined by a single analyst should be 300 per annum. But actually due to acute shortage of scientific staff, the number of samples assigned to each analyst on the average is nearly 5 times that considered proper by the Committee.

The Government Analyst attended the Indian Standard Institution Ante Spurious Drugs Committee 12:4 Sub-Committee meeting held in Bangalore in January, 1961.

He gave evidence before the District Munsiff-Magistrate at Kuppam in a case under the Prevention of Food Adulteration Act in June, 1961.

The Government Analyst attended the Pharmacy Council meeting on 25th October, 1960 held at the Madras Pharmacy Council Office, Mount Road, Madras.

The Deputy Government Analyst gave evidence in cases under the Prevention of Food Adulteration Act before the District Munsiff-Magistrate, Kuppam in May, 1960 and before the Additional I Class Magistrate, Tuticorin in December, 1960.

The Deputy Government Analyst gave evidence before the Expert Committee appointed by Government for offering suggestion for the improvement of the King Institute on matters affecting the working of the Government Analyst Department.

In partial modification of the previous Government orders on the subject, the Government Analyst was appointed in G.O. Ms. No. 1739, Health, dated 2nd July 1960 as Government Analyst (Drugs) for the whole of the State of Madras in respect of all drugs other than the items 1 to 7, 11 and 14, of Schedule C, to the Drug Rules, 1945.

The Government Analyst gave evidence before the Chief Presidency Magistrate on 30th November 1960, in a prosecution under the Drugs Act, for sale of substandard Sodium Chloride by a firm of manufacturing Chemists. The judgement pronounced in this case is given in Appendix B.

The Department continues to render advisory and other services to private firms and institutions, food inspectors, etc.

During the year under review 42 Coffee manufacturing firms who were using defective labels for Coffee chicory mixtures were advised to change the form of their labels according to the Rules and there has been excellent response and compliance with the labelling Rules.

In cases under Prevention of Food Adulteration Act, which ended in acquittals on unjustifiable grounds, proposals were sent by this Department for appeals against the acquittals. Sixteen cases in Andhra Pradesh and ten cases in Madras were admitted by the respective High Courts for disposal during the year. In a number of cases in Andhra Pradesh and Madras, the Food Inspectors sought the advice of this Department for proper presentation of the cases in Court, from technical point of view, and for rebutting untenable defence contentions.

There has been practically no increase in laboratory facilities for the enforcement of the Prevention of Food Adulteration Act for the last decade or more in spite of the public outcry against the adulteration evil. A programme of intensive and extensive sampling is one of the prime requisites for rooting out food adulteration. Proposals have been submitted for a reorganised and upgraded state Food and Drug Laboratory and a regional laboratory. These proposals though modest considering the magnitude of the problems to be tackled, will, if given effect to, go a long way to ensure a pure and safe food and drug supply for the people of the State.

The State Food and Drug Laboratory is expected to take the place of the existing Government Analyst's Laboratory, the shortcomings of which have been stressed in previous reports. It will have an over-all laboratory space of 25,000 square feet, modern equipment, and the capacity to analyse 30,000 samples of foods and 500 samples of drugs per year. The new laboratory would provide accommodation for staff nearly double that of the existing laboratory.

It is proposed to organise this laboratory on the lines that experience has shown to be most conducive to efficiency and the successful tackling of not only the orthodox forms of adulteration met with hitherto, but also the challenge posed by the new threat to food supplies from coal-tar colours and other synthetic additives and pesticide residues. In addition to section for the routine examination of common foodstuffs for adulteration, the reorganised State Food and Drug Laboratory will have the following scientific division :—

(i) a Coal-tar food and drug Colours Divisions.

(ii) A Food Additives Divisions to deal with added preservatives, stabilisers, emulsifiers and flavouring agents to food.

(iii) a Pesticides and Toxicology Division to deal with agricultural insecticide residues, fumigants, trace metals etc., in food.

(iv) a Microbiology Division, for detecting food spoilage, bacteriological examination of food. Assay of Vitamins, amino acid, etc.

(v) a Research Division—for research on the methods of analysis of food, drugs, cosmetics, etc., collaborative study with other laboratories; for laying down standard, for foods and other materials and other special investigations.

The Regional Laboratory under the Third Plan is expected to be located in Coimbatore. It is proposed to analyse about 20,000 samples of foods in the Regional Laboratory.

II. WORK UNDER THE PREVENTION OF FOOD ADULTERATION ACT.

The Act was worked in 170 local bodies in Madras State comprising 63 municipalities and 107 panchayats. The Government Analyst Laboratory continued to analyse samples from Andhra Pradesh also during the year, since the laboratory at Hyderabad was not yet ready to take up analysis of foods under the Act. Ninety-five Local Bodies in Andhra Pradesh comprising 46 Municipalities and 49 Panchayats sent samples to the department for analysis.

Five more panchayats in the Madras State were permitted to send samples under the Act during the year. Bhavanisagar Township Committee was permitted to send samples from 1st November 1960, while Kalakkadu, Krishnagiri, Sendamangalam, Uthamapalayam Panchayats were permitted to send samples from 1st January 1961. It may be possible to work the Act in many panchayats in this State and also to permit bigger municipalities to send a larger quota of samples for analysis, when Andhra Pradesh samples cease to send samples during the coming year.

III. FOOD INSPECTORS PROBLEMS AND SUGGESTIONS.

A questionnaire was sent by this Department to the local bodies in the State regarding the working of the Prevention of Food Adulteration Act in their area during the year. They were specially requested to furnish reports about the salient features of their enforcement programmes; the difficulties experienced, and any suggestions for better working of the Act. Some local bodies have sent full answers to the questions and have offered useful suggestions.

Many local bodies require an increase in their monthly quota of samples to be sent for analysis to effectively control adulteration in their local areas.

Some local bodies have complained that the bye-laws of co-operative societies are not available and they suggest that an order may be passed making it obligatory for co-operative societies to submit a copy of their bye-laws and all amendments to the local body. In this connection, attention of the local bodies is drawn to Government Memo. No. 94552-C/54-2, dated 5th December 1954, wherein Government have directed all co-operative societies to furnish a copy of their bye-laws to local bodies having jurisdiction over their area of operation.

Watered milk with the addition of sugar and in some instances, masala, is being freely sold in tea stalls and some inspectors want that the rules should be amended so that action may be taken against such offences.

There has been a complaint from some local bodies that Saccharin is being added to tea and coffee in hotels. Rule 47 which requires an adhesive declaratory label on the container cannot obviously be applied to coffee and tea served in cups in restaurants. It is a matter for the Central Committee for Food Standards to consider whether a standard could be prescribed for Coffee and Tea beverages prohibiting the addition of Saccharin and colouring matter.

One municipality has suggested that the words as an "edible oil" in Rule 44 (e) should be deleted. The rule as it stands appears to permit the sale of a mixture of two or more edible oils if it is stated to be a non-edible oil.

Several food inspectors are of the opinion that the cadre of Food Inspectors should be provincialised so that they might be above local influences and can have greater freedom of action.

The vast majority of food inspectors have complained of the practical difficulties in complying with Section 10 (7) of the Act. Although sampling

takes place in the presence of large numbers of persons, no one comes forward to attest the records, and in the rare cases where independent witnesses are procured, they perjure themselves and turn hostile at the hearing of the case. The suggestions that the entire section might be deleted is not likely to find favour with Parliament. The course for Inspectors to follow under the present circumstances is to try hard to get independent witness, and if such witnesses are not available to record the fact in the diary, and then call upon Municipal Employees to attest sampling. It is only when public opinion were round to the view that food adulteration is a criminal offence like assault or robbery and it is the duty of the citizen to aid the authorities in bringing offenders to book at the risk of some personal inconvenience that it will be possible to get reliable independent witnesses.

Reference has been made by some local authorities to the practice adopted by many vendors of putting up notices to the effect that the Gingelly oil, or Turmeric or other food sold in their shops is not intended for use as food. The Andhra High Court gave a ruling that an article for which a standard is prescribed in the Prevention of Food Adulteration Rules should conform to the standard even if it is not intended for human "consumption" but for "use". The best way to deal with such tactics is to incorporate in the Regulations a special condition for licence for sale that no food which is stated to be not useable as food should be stored for sale in the same premises where other foods are sold and to strictly enforce this condition.

Some Food Inspectors have urged that they should be empowered to call for the records of shopkeepers so as to get at the actual offender, salesman, etc.

One local body has suggested that a form may be prescribed for the receipt to be obtained from the vendor, providing space for the signature of witnesses. It is also suggested that this receipt might be in duplicate so that a copy may be sent to the Audit Department for audit purposes.

Suggestions have been made that Bread, Biscuit, Syrups, Sherbets, Tinned Foods, Badam Halva, Badam Ksheer, Basanthi, Areca nut, shall be sampled and examined under the Prevention of Food Act.

One local body has suggested the publication of a Journal by the State or Central Government devoted to the enforcement of the Prevention of Food Adulteration Act.

It is not generally realized that many misbranding and adulteration offences are to be controlled by an intensive programme of inspection by Food Inspectors rather than by analysis. It is hoped that when the State Government rules under section 24 are brought into force defining licensing authorities, forms of licence, licensing fees, conditions of licensing, etc., many forms of misbranding and adulteration could be effectively put down. The Food Inspectors have to pay particular attention to the violation of the licensing conditions when they are enforced and violations of labelling provisions—such as failure to indicate addition of colouring matter, Saccharin, etc., to food on the label; failure to label packaged foods with the name of the firm, name and address of the manufacturer, presence of additives like, preservatives, antioxidants, colours, vitamins, etc., and batch number,

etc., as required by Rule 32; the sale of skimmed milk powder without the label-warning "Unfit For Babies" and use of misleading labels for Coffee-chicory mixtures, etc.

IV. FOOD POISONING.

Samples of foodstuffs alleged to be connected with food poisoning cases are being received frequently:—

1. In April, 1960 several cases of fatal poisoning were reported in Karaikal as a result of consumption of maida flour, and bread made out of such flour. It was also stated that Century Flour Mills at Madras were the suppliers of maida to Karaikal. This caused quite a stir, and a screening of all maida samples from Century Flower Mills sold in various parts of the State was undertaken, and in all 32 samples were examined for parathion contamination, but no case was encountered, where the food was so contaminated. The samples examined under this head is given in Table IV in Appendix E.

In June 1960, the Secretary General Administration Department, Pondicherry State sent to this laboratory, 18 samples of maida and one sample of bread of examination for presence of toxic material in them. No poison was found in any, except in one sample of maida which was found contaminated with an organo-phosphorous insecticide.

2. On 5th November 1960 the Employees Labour Union of Dharangadhara Chemical Works reported to the Chief Inspector of factories about an incident of Food Poisoning in the works canteen in which about 100 worker were effected. The symptoms noted were vomiting and diarrhoea and in some cases unconsciousness, also. The poisoning was attributed to the partaking, by the workers of "Bajji". "Lime Bath". "Pulivotharai". prepared in the canteen on that day.

Samples from the stock of groundnut oil, bengalgram flour and rice in the canteen from which the preparations were made, were sent to this laboratory by the District Health Officer. These samples were examined for and chemical poison, damage or deterioration, and also for toxicity to experimental animals; but no poison could be detected in materials received here.

3. Three months later on 17th January 1961 about 30 workers in the Dharangadhara Chemical Works, Sahupuram, were again the victims of severe vomiting and giddiness and unconsciousness as a result of taking 'Vadai' prepared in the canteen. In this case, the oil used for the preparation came under suspicion since the oil used were old and was stored in the canteen for a long time. Under instructions from the Director of Public Health, the Health Inspector, Tiruchendur sent to this laboratory samples from each of about dozen tins of groundnut oil found in the preparation was also called for, and all the 13 samples were examined systematically for metallic and other chemical contamination. But no extraneous chemical poison was found in any of the samples. Two samples were found on analysis to be a mixture of groundnut and nigerseed oils, and they were also highly rancid and unfit for human consumption. The remanant oil from the frying pan, was also highly rancid as shown by its high peroxide value and its strongly positive Kreis test. The poisoning

has evidently been the result of use of the highly oxidised and rancid oil, as it is known that oxidised and heated oils can cause severe gastric symptoms such as vomiting and diarrhoea very soon after consumption, and in some cases even death.

4. On 24th December 1960, a case of severe poisoning in Tiruchirappalli as a result of taking bread made out of varagu rice (Pasupalam Scrobiculatury Linn) in which a group of 14 persons were involved was reported by a Municipal Councillor, Tiruchirappalli to the Municipal Commissioner for necessary action. The symptoms were gidding, shivering and vomiting. All the victims were removed to the Headquarters Hospital, and were given treatment. The condition of two ladies among the victims were stated to be very serious.

It was found that there was no remnant of the bread or the varagu rice used left in the house of the victims and that the varagu was got from Vallam in Tanjore District through their relatives. On instructions from the Director of Public Health and the District Health Officer, Tiruchirappalli, to whom the matter was reported, the Health Inspector, Thanjavur South Range, contacted the persons in Vallam who had supplied the alleged poisonous varagu and got the samples available there on 16th January 1961 and sent them to this laboratory for examination. The samples received here were however found on analysis to be of the non poisonous variety.

5. In connection with the outbreak of a form of epidemic diarrhoea in the South Arcot District, a number of samples of rice, ragi, cholam, Rambu, groundnut, groundnut oil etc., were received for examination from the Health Inspectors in March this year.

V. TECHNICAL NOTES.

A number of experimental studies on the deterioration and change in chemical characteristics of certain foods on storage were carried out in this laboratory.

Work was done during the previous year, by K. Ramachandran and others to study the rate of increase in the Free Fatty Acid content of edible oils. Under conditions of storage in the laboratory, where the bottles are kept tightly corked and stored in a cool dark place. Portions of samples were periodically taken out and analysed for their Free Fatty Acid content and the results are given in Table A. It has been found that in the case of good quality oils the increase in the Free Fatty Acid content in three or four months is negligible and is not appreciable even in six months.

TABLE A.

Date of analysis:	1 Sample No. 1 gingelly oil.	2 Sample No. 2 gingelly oil.	3 Sample No. 3 gingelly oil.	Date of analysis.	4 Sample No. 4 groundnut oil.	5 Sample No. 5 groundnut oil.	6 Sample No. 6 groundnut oil.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
28th August 1958 ..	2.1	3.1	1.5	10th December 1958.	2.6	1.8	2.7
29th September 1958.	2.1	3.2	1.6	10th January 1959.	2.7	1.9	2.8
28th October 1958 ..	2.2	3.2	1.6	10th February 1959.	2.8	1.9	3.1
28th November 1958.	2.26	3.3	1.7	16th March 1959 ..	2.9	1.9	3.1
24th December 1958.	2.3	3.3	1.7	20th April 1959 ..	3.1	2.0	3.4
27th January 1959 ..	2.4	3.4	1.8	4th June 1959 ..	3.2	2.1	3.7
26th February 1959.	2.5	3.6	1.8	....	..	..	..

Whereas on samples which had a high Free Fatty Acid content to start with, showed a higher rate of deterioration and poor keeping qualities.

An investigation as carried out in the previous year change in the R.M. value and Reference Index of the fat prepared from market butter stored under normal conditions. The results are recorded in Table B.

TABLE B.

Date of analysis.	Sample No. 1.		Date of analysis.	Sample No. 2.		Date of analysis.	Sample No. 3.	
	R.M.	Refn.		R.M.	Refn.		R.M.	Refn.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
20th November 1958.	26.3	43.2	5th December 1958.	25.2	43.4	12th December 1958	25.7	43.8
19th December 1958.	25.9	41.5	5th January 1959 ..	23.3	41.1	10th January 1959.	24.4	41.5
27th January 1959 ..	25.3	40.6	10th February 1959.	22.9	40.2	18th February 1959.	23.8	41.0
21st February 1959 ..	24.9	40.2	5th March 1959 ..	22.3	39.8	12th March 1959 ..	23.1	39.5
20th April 1959 ..	24.8	39.8	5th May 1959 ..	22.4	38.3	11th May 1959 ..	23.0	..

The results shown that the decrease in R.M. value due to storage was not appreciable over a period of six months. Samples of butter which are clean in appearance which are obviously of good quality showed better keeping quality as far as R.M. value is concerned than dirty specimens. A low stability of R.M. value may be taken as an indication of poor sanitary quality of the butter. A sample of country butter made under hygienic conditions divided into 12 parts and placed in separate containers were received from Central Food Laboratory for a collaborative study of effect of storage on R.M. value. The portions were kept at laboratory temperature and examined one by one at intervals of one month and the results are given in Table C. The results showed that R.M. value of clean butter is remarkably stable for long periods even under ordinary condition of storage at laboratory temperature.

TABLE C.

Date of analysis.	Sample number.		Moisture.	R.M.	Refn.
(1)	(2)	(3)			
	NO.		(3)	(4)	(5)
11th March 1959 ..	2	13.5	31.0	40.6	
13th April 1959 ..	3	13.8	31.1	40.1	
9th May 1959 ..	4	13.5	30.9	40.6	
10th June 1959 ..	5	13.5	30.9	40.4	
11th July 1959 ..	6	13.7	31.6	40.7	
12th August 1958 ..	7	13.8	31.6	40.7	
13th September 1959 ..	8	13.6	31.1	40.5	
14th October 1959 ..	9	13.7	31.7	40.6	
11th November 1959 ..	10	14.2	31.2	40.4	
12th December 1959 ..	11	10.3	30.5	40.3	
18th January 1960 ..	12	13.5	31.0	40.8	

When the samples are kept in cold storage as is done in this laboratory all processes causing deterioration in butter is arrested, and even poor quality butter show considerable stability of R.M. values and no noticeable change occurs over a period of several months of cold storage. Despite these facts and observations no changes are taken and analysis of butter samples

and determination of free fatty acid in oils, are done in this laboratory with utmost expedition—as far as possible, within a fortnight of their receipt.

A study of the sterol acetate test was carried out to determine to sensitivity of the test or the minimum percentage of vegetable oils or vanaspathi in ghee that could be detected. It was found that using the digitonin technique followed in this laboratory amounts as small as 3 per cent of vegetable fat could be detected in ghee. The melting point of the sterol acetate in the limiting case was 117° C after two crystallisations.

The use of non-permitted colours in foods is a form of adulteration that is on the increase. Experiments conducted in this laboratory during the year have led to the evolution of a satisfactory paper chromatographic method for the separation and identification of coal-tar colours in foods. Sri P. S. Nataraja Sarma and Kondal Rao have found that a solvent system consisting of Ethylenediamine and butanol and water is more satisfactory than many of the solvents so far tried.

In connection with a proposed collaborative study of method for determining the alcohol soluble extractives in compounded asafoetida initiated by the Director, Central Food Laboratory, this Laboratory had to point out the defects in some of the methods there were considered simple and convenient, and recommend the USP 1936 method as the only reliable one to be adopted.

Determination of Folic acid in Pharmaceutical preparations.—Though the published literature on the colorimetric determination of folic acid is vast, the application of the method to complex pharmaceutical preparations is fraught with practical difficulties. A study of the method was carried out during the year by M. V. Narayanan and Company Workers in order to arrive at a satisfactory routine procedure applicable to all preparations.

As is well known folic acid is easily decomposed by light and at PH values below six. It has been found that in many pharmaceutical preparations containing folic acid, the PH is less than six, and in these preparations most per cent of the folic acid is in the decomposed state with formation of free p.amino benzoyl glutamic acid.

The total folic acid (undecomposed plus decomposed folic acid) in the sample should be determined after reduction with zinc and hydrochloric acid and measurement of colour developed with Bratton Marshall reagent against the black while, decomposed folic acid could be determined direct without a reduction step. Undecomposed folic acid is obtained by difference.

The blank used in the USP for folic acid determination in the official preparations and as used by workers in the field, could not be adopted for many proprietary drug preparations, which contain liver extracts and added coal tar colours. The blank used should include these colours as they on treatment with zinc and hydrochloric acid get modified and the un-reduced blank sometimes has a stronger colour than the reduced solution after colour development. Therefore the original solution itself subject to reduction and diazotisation, but without the Bratton Marshall reagent, is used in this laboratory as the blank in the determination.

It has been found that this colorimetric method cannot be directly applied to the determination of folic acid in preparations containing ferric ammonium citrate or ferrous sulphate. Preparation containing iron on dia-tisation, and treatment with ZON-(1) naphthyl ethylene, diamme dihydro-chloride yield a violet colour which quickly fades to a dirty brown, and the reaction between diazotised folic acid and the coupling agent appears to be inhibited.

The sequestration of iron by means of EDTA prior to the determination, as described by Gandhi and Kanetkar (Indian Journal of Pharmacy P 20, No. 7, July 1958), has been found to eliminate interference by iron.

IV WORK FOR OTHER GOVERNMENT INSTITUTIONS.

1. *Hospital food supplies.*—Diet articles numbering 7,275 from the Government hospitals in the State were analysed and 931 were reported as adulterated or otherwise unsatisfactory.

Milk.—Out of 1,021 samples, 160 samples contained added water and 39 were deficient in fat.

Toned milk.—Out of 186 samples received 159 were reported as unsatisfactory. Fifty-five samples were found deficient in fat; 78 samples were deficient in solids not fat, 26.

Coffee powder.—Out of 967 samples 56 samples were reported unsatisfactory; the adulterants detected were fried and ground wild date seeds in 40, coffee husk in six and chicory in 10.

Bread.—Out of 885 samples, 85 had acidity above the permitted limit and eight were not properly baked.

Dhall.—Out of 819 samples, 107 samples contained artificial yellow colour derived from coal tar.

Sugar.—Twenty-two out of 656 samples contained less than 85 per cent total sugar and were reported as unsatisfactory.

Butter.—Out of 613 samples, 160 were reported as unsatisfactory. Of these 105 contained excess water and 55 contained foreign fat.

Rice hand-pounded.—Out of 456 samples, 20 were found to be milled polished rice.

Biscuits.—Twenty samples out of 430 were reported unsatisfactory as the fat extracted from them had excessive acidity.

Ghee.—Out of 411 samples, 76 were reported as adulterated, 28 for containing foreign fat and 48 for excessive acidity.

Gingelly oil.—Out of 223 samples, 11 were adulterated with groundnut oil and 35 samples were reported as unfit for use, due to their free fatty acid content much above the permitted limit.

2. *Certified schools and jails.*—A total of 14 samples from this source was analysed.

Out of three samples of milk one sample was adulterated with 10 per cent added water. Out of four samples of gingelly oil three samples were reported as unfit for human consumption for having acidity above the permitted limit and one sample of bread had acidity above the permitted limit.

8. *Miscellaneous sources.*—Out of 20 samples of milk powder received from other sources, 16 samples were reported as unfit for human consumption (See Table V in Appendix).

One of three samples of milk received two samples were reported as adulterated. One sample of coriander received was reported as unsatisfactory since it contained excessive gritty matter. One sample of maize received was reported as unfit for human consumption. Four samples of coloured sago received were reported as misbranded.

4. *Directorate of Industries and Commerce.*—Ten samples of vanaspathi taken by Assistant Director of Industries and Commerce under vegetable Oils Products Control Order were examined during the year. All of them were found to conform to the prescribed specification-Table VII in Appendix E gives the different brands thus examined.

VII. ANALYSIS OF DRUGS AND PHARMACEUTICAL PRODUCTS.

The work falls mainly under four heads:—

(1) Examination of medical supplies, to Government hospitals and examination of stock mixtures in hospital dispensaries.

(2) Work in connection with enforcement of the Drugs Act, 1944.

(3) Analysis of drugs and pharmaceutical preparations for private persons and firms.

(4) Work which come under the category of forensic analysis, such as analysis of drugs in connection with the enforcement of other statutes like Dangerous Drugs Act, Prohibition Act, Indian Penal Code, etc

The total number of samples received during the year was 438 as against 370 samples last year. Several requests for analysis from private firms has to be declined owing to pressure of work and want of adequate facilities. Table X in Appendix E gives a summary of the different categories of drugs analysed during the year under received.

Samples from hospitals.—Table XI gives the particulars of samples of drugs received from the hospitals and medical institutions.

It may be noted that nearly 73 per cent of the total number of hospital dispensary stock-mixtures were found to be incorrectly dispensed. This would indicate the need for better check over the work of the compounders and for appointing better trained pharmacists.

A certain mixture was reported to have caused serious symptoms of poisoning in a few patients in the Kanyakumari Hospital. The remnants of the mixture consisting of a few c.c. were sent for analysis by the District Medical Officer. The sample was found to be mainly quinine sulphate mixture; but the quantity available was too small to permit a fuller examination for other alkaloids and poisons.

A sample of ethyl chloride received from the Medical Superintendent, Christian Mission Hospital, Madurai was found on analysis to be plain water. A sample of anesthetic ether from this hospital was found to be satisfactory and reported as conforming to pharmacopoeial standard.

Samples under Drugs Act.—During the year under review, 121 samples of drugs comprising 79 pharmacopoeial drugs and 42 proprietary preparations and 9 samples of absorbent gauze and cotton sent by the Drug Inspectors were analysed and reported upon. While samples were of sub standard quality there were a few glaring instances of deliberate fraud.

A sample of light kaolin claiming to be of B.P. quality was found to contain a large amount of coarse and gritty material. Five samples of B.P. "Tinctures" sent by the Drugs Inspector, Madras were found to be considerably deficient in drug contents, while their alcohol contents was found to be alright. A sample of "absorbent" gauze which was expected to absorb water to saturation on soaking, within 1—0 seconds, took 240 seconds for saturation. The sample also contained 2 per cent of water soluble impurities while the prescribed limit for such impurity was only 0.5 per cent.

A number of samples of "Vicks" inhaler, and ointments were examined when they were sent by Drugs Inspector, Madras, on suspicion that they were spurious. Compared with the authentic specimens it was found that the suspected samples were deficient in drug content and closer examination of the labels and the design of the containers, revealed that the seized materials were limitations of the original.

A sample of 'Glucose' powder received from the Drugs Inspector, North Arcot district was found to be powdered cane sugar and rice starch.

The particulars of samples analysed under the Drugs Act are given in Table XII.

Samples from private persons.—A sample of eucalyptus oil, received from one Ramanathan Jayalakshmi and Company, Bhimavaram, was reported as satisfactory.

One sample of Chlorpromazine HCl (largactyl) was sent by Dr. Sulo-chana Bai of New Delhi for analysis, as it was found to be slightly discoloured and of doubtful effectiveness. The sample however was found on analysis to be standard quality.

A sample of Eucalyptus oil I.P. from a Salamath Trading Company, Kotagiri was found to conform to I.P. specification.

VIII. FORENSIC ANALYSIS.

The work which is concerned with crime under other Penal Statutes like the Indian Penal Code, Dangerous Drugs Act, Prohibition Act, Trade and Merchandise Marks Act, etc., continue to increase and during the year under review 46 samples of various materials were received from the Police and Magistrates for examination and report.

A case of cheating by a drug dealer in Virudhunagar was detected by the Police when a purchaser complained to the Police about the quality of a proprietary preparation called "Elixir Bivisim", supplied by the dealer on the prescription of a medical practitioner. The prosecution case was that the dealer filled the container bearing the label of "Elixir Bivisim" with some other cheaper preparation from a large container bearing a label "Elixir B-Complex". The sample purchased by the complainant was sent for analysis by the Additional First-class Magistrate, Virudhunagar along with authentic specimen of "Elixir Bivisim" and "Elixir B-Complex". Analysis revealed that the material supplied in "Elixir Bivisim" container was not the genuine product.

A sample of Tincture Zingiberis Mitis B.P. received from the Seventh Presidency Magistrate, Madras, was reported to be of substandard quality.

A case under section 11 of Madras Prohibition Act was registered by the Sub-Inspector of Police, Sivakasi, against the owner of an Ayurvedic shop in Virudhunagar for possession of alcoholic preparation for sale without valid licences.

On 7th November 1960, 14 bottles of alleged Ayurvedic Asavas were seized by the Mobile Party—Sub-Inspector of Police and sent here for analysis through the Sub-Magistrate, Virudhunagar. All the samples were found to contain alcohol in amounts varying between 8 to 13 per cent v/v—without any label declaration.

Again on 7th January 1961, another pharmacy in Virudhunagar was searched by the Police on suspicion that the firm was selling alcoholic preparations without permit and 90 bottles of alleged Ayurvedic Aristas and Asavas were seized and four samples were sent for analysis through the Sub-Magistrate. The samples were reported to contain alcohol in amounts varying between 11 to 15 per cent.

On 2nd June 1960, the Deputy Commissioner of Police, Crime Branch reported a case of theft of quinine sulphate from the Dispensary of the Employees State Insurance Department Narasingapuram and substitution of this drug with a "White Powder". The tin was seized, and case under Section 380 of Indian Penal Code registered against the persons concerned. A sample from the tin sent for examination was found to be Sodium Bicarbonate.

A material suspected to be a dangerous drug was seized by the Police and brought before the Sub-Magistrate, Keeranur was sent here for analysis. The sample was examined for presence of alkaloids of Opium and Coca and also for Cannabis India. The material did not contain any of these drugs.

2. Samples of alleged Chilli Powder seized by the Police on suspicion from a Grocery shop keeper under Section 420, Indian Penal Code. The samples were found on analysis to be a mixture of equal parts of Guilli Powder and smooth pea flour.

Five samples of Tincture zingiberis Mitis sent by the Sub-Magistrate, were sent for analysis by the Additional First-Class Magistrate, Tiruchirappalli in April, 1960. The samples were reported to contain Opium in varying amounts.

Five samples of Tincture zingiberis Mitis sent by the Sub-Magistrate, Tuticorin, were reported as being of standard quality.

Samples of Oils described as "Three Flag Brand French Olive Oil" on the label were seized from a pharmacy in Madras by the Police under section 79 of the Trade and Merchandise Marks Act, 1958 and were sent here for examination by the Deputy Commissioner of Police, Crime Branch, Madras City. The "Olive Oil" were found on analysis to be groundnut oils coloured bright yellow with a coal tar dye.

On 15th March, 1961, a bottle containing brownish liquid and bearing the name "Teepal" on the label which claimed that the product was made by the Imperial Chemical Industries, England, was sent by the Sub-Magistrate, Nagercoil, for analysis and report, in connection with a case under Section 420, Indian Penal Code. The history of the case was briefly this—

a person who called himself K. S. Nair visited along with a companion, the office of the Principal of the Polytechnic College, Nagercoil introduced himself as the representative of the Imperial Chemical Industries and offered to demonstrate the qualities of his product. He was very soon identified as a cheat by one of his former victims and the said K. S. Nair, immediately made good his escape leaving his companion and his bag, behind.

It was found on enquiry from the local representatives of the Imperial Chemical Industries (in Madras) that the Imperial Chemical Industries had not put on the market any product under the name "Teepal". The bogus product was found on analysis to be a strong solution of Caustic Soda (about 12 per cent strength) containing a small proportion of the proprietary detergent powder "Surf".

Spurious Cosmetics.—The City Police 'X' Branch raided the business premises of one Basha who was suspected to be deceiving the public by refilling old containers of well known products with spurious stuff and selling them genuine ones, Samples of Pears Talcum Powder", "Himalayan Boquet" powder, "Amarutanjan", Ponds Dream Flour Talcum Powder", "Ponds Cold Cream" and "Ponds vanishing cream" were seized from the premises and were sent here for analysis by the Deputy Commissioner of Police, Crime Branch, Egmore, in connection with case under Sections 420, 482, and 483 of the Indian Penal Code against the accused. The samples were compared with authentic specimens of the respective products and it was found that the suspected samples were markedly different from the genuine ones in respect of smell; moisture content; volatile matter; chloroform extractives; appearance under ultra violet light etc. The samples received were all declared to be spurious.

*The King Institute, Guindy, Madras-32,
16th September 1961.*

K. R. Srinivasan,
Government Analyst.

APPENDIX A.

FOOD AND DRUG LAW AMENDMENTS.

During the year under review a number of amendments have been made to the Prevention of Food Adulteration Rules. The addition of natural colours in food is not be unrestricted. It is prohibited in sago.

Amaranth and Erythrosine have been added to the list of permitted colours.

The use of carbitol as a flavouring agent is prohibited.

Turbidity temperature has been included in the standards for Sesame oil and Safflower oil.

Vanaspathi with a melting point of 41°C has been recognized as bakery shortening.

A standard has been prescribed for synthetic vinegar.

The sale of Kesari gram dhal and flour and the mixture of Kesari gram dhal with any other gram or dhal is prohibited.

Two categories of butter are recognized. Table or Creamery butter with a moisture limit of 16 per cent, and Deshi butter with a moisture limit of 20 per cent.

The amendments are published in *Fort St. George Gazette* and issued under G.O. Ms. No. 1401, Health, dated 17th May 1960 and in G.O. No. 608, dated 11th March 1961.

The Drugs (Amendment) Act, 1960 (No. 35 of 1960) came into force on 16th March 1961.

In this Act amendments have been made in sections 3, 19, 22, 31 and 33 of the Drugs Act, 1944. The scope of sections 20, 21 and 27 of the Principal Act have been enlarged by substituting new sections; whereby the Central Government are empowered to appoint Government Analysts and Drugs Inspectors under the Act; the penalties for manufacture, sale, etc., of drugs in contravention of this Chapter have been greatly increased. A new section 33-A after section 33 of the Principal Act has been introduced which gives power to Central Government to give direction to State Governments for carrying out of any of the provisions of the Act or any rule made thereunder.

APPENDIX B.

LEGAL PROCEEDINGS.

1. A charge under the Act cannot be sustained if seizure and sampling are not seen by the witnesses who attest the mahazar—*Andhra Pradesh High Court—Criminal Appeal No. 460 of 1960.*—An appeal by the State against the acquittal of a vendor who was charged with selling adulterated ghee was disallowed by the High Court with the following observations:—

"The learned Judicial First-class Magistrate, Kurnool, has acquitted the accused of an offence under section 16 (1) (a) read with section 7 (1) of the Prevention of Food Adulteration Act, 1954, on the main ground that while seizing and sampling the butter, no witnesses were present. It is, however, stated by the prosecution that two witnesses attested the mahazar but that they did not see the seizure or sampling. The learned Magistrate finds that

in the bazaar where the shop of the accused was situated, there are number of shops and it is not as though witnesses could not be had if only the Food Inspector (P.W. 2) was in a mood to comply with the provisions of section 10 (7) of the Act; but that this is a case in which the mandatory provisions of the section have been purposefully violated. Such being the finding, a presumption of prejudice would necessarily arise. The acquittal of the accused could, therefore, be said to be for valid and proper reasons. I am unable, therefore, to admit this appeal, and it is dismissed."

2. *Non-compliance with section 10 (7) is a curable irregularity if it has not caused any prejudice to the accused—Andhra Pradesh High Court, Criminal Appeal No. 628 of 1959.*—Allowing the appeal by the State against the acquittal by the lower Court of a milk vendor who was charged with offence of selling milk adulterated with 13 per cent of added water. The High Court made the following observations:—

In more than one judgment, this Court has pointed out that the contravention of the provisions of the above sub-section does not *per se*, entitle the accused to an acquittal, and the real question is whether in the circumstances of each case the accused has or has not been prejudiced. Where no such prejudice is caused, the irregularity is curable. The Munsif-Magistrate has apparently not been keeping himself in touch even with the decisions of this Court.

The evidence in the case clearly establishes that the accused was found in possession of vessel containing milk and that on being questioned by the Food Inspector (P.W. 1) he said that the milk was meant for sale; that thereafter P.W. 1 purchased $\frac{1}{4}$ seer of milk from the accused by paying him Re. 0-4-6. Thereafter, following the procedure prescribed by the Act, P.W. 1 sent the sample to the Public Analyst and the report of the Public Analyst, Exhibit P-3, showed that the milk contained 13 per cent of added water and was, therefore, adulterated. P.W. 2, the Sanitary Maistry, who was in the company of P.W. 1 at the time of the seizure, corroborated P.W. 1 in all material particulars.

The plea of the accused was that he does not sell milk, but that he was taking the milk in brass vessel to hotel by purchasing the same for the hotel from somewhere else; that P.W. 1 took $\frac{1}{4}$ seer of milk from him and asked him to sign on a paper which he did but no sampling or any such thing was done. He examined two defence witnesses, one of whom was Nagayya, P.W. 1, who had attested Exhibit P-2, the panchayatnama, evidencing the purchase of milk for sampling. D.W. 1 supported the accused and stated that no sampling was done by P.W. 1 at all and that P.W. 1 had asked him to sign on a blank paper representing to him that a sample had been taken and that the blank paper would be filled up later on. D.W. 1 is demonstrably a false witness and the Magistrate should have launched a prosecution against him for perjury. The Magistrate himself was not prepared to accept the evidence of this witness as also that of D.W. 2, who gave evidence of the same character.

In this case P.W. 1 fought D.W. 1 to be present at the time the milk was seized. But even this person had turned hostile and would not support the prosecution case. Such being the public co-operation that is forthcoming in bringing offenders to book, it is idle to insist on rigid compliance with the provisions of section 10 (7) of the Prevention of Food Adulteration Act and throw out cases.

3. *Non-compliance with section 10 (7) is not material when the vendor admits the sale—Andhra Pradesh High Court—Criminal Appeal No. 640 of 1959.*—Allowing the appeal by the State against the acquittal by the lower Court of the two respondent who were charged with the offence of selling butter

adulterated with excess moisture, the High Court gave its ruling on the applicability of the Madras High Court judgment in the well-known case of Raju Konar *alias* Swaminatha Konar in *re* (1) 1958 (II) M.L.J. (Criminal), P. 697. The following is an extract from the judgment:—

The learned Magistrate with reference to Raju Konar *alias* Swaminatha Konar in *re* (1) [1958 (LL) M.L.J. (Criminal), P. 697], has chosen to dismiss the complaint for non-compliance with section 10 (7) of the Act. But, the ruling does not specifically lay down that due to omission on the part of the Food Inspector, the entire trial is vitiated, particularly, when there is an admission on the part of the accused involved in it as to the guilt. In that case the learned Judge on the facts of the case held, that there was a deliberate attempt on the part of the Food Inspector to overlook the provisions of the Prevention of Food Adulteration Act, and in view of the repeated instances of that nature, set aside the conviction. It was also a point in that case that the accused involved had refused to send the sample. But, the facts of this case are different. Here the sample was sold by accused 1 and he admitted that he committed the offence, so that this does not seem to be applicable.

4. *Does section 10 (7) prohibit attestation by departmental employees.*—There seems to be a divergence of opinion on this point as the two High Court judgment abstracted below will show:

(a) *Section 10 (7) does not contemplate independent witnesses. There is no objection to the Sanitary Maistry attesting. Getting witnesses not obligatory if circumstances do not permit—Andhra Pradesh High Court—Criminal Appeal No. 491 of 1959.*—Allowing the State appeal against the acquittal by the District Munsif-Magistrate, Gudur, of a vendor who was charged with the offence of selling gingelly oil containing excess of free fatty acids, the High Court observed as below. The acquittal by the Magistrate was on the ground that the provisions of section 10 (7) were not complied with inasmuch as the presence of the Maistry, P.W. 2, as a mediator was not within the contemplation of the Act, and there must be at least two independent mediators.

The seizure of the sample cannot be considered to be in contravention of sub-section (7) of section 10 of the Prevention of Food Adulteration Act inasmuch as that sub-section enjoins that as far as possible, there should be at least two witnesses. It does not speak of the witnesses being independent though on a reasonable reading of it, witnesses must not be interested. Even so, the words "as far as possible" do not make it obligatory on the part of the Inspector to get two witnesses, if the circumstances do not permit him to do so. In this case, P.W. 3 is a neighbour and if at all his evidence is inclined to be in favour of his brother-trader. P.W. 2 may be a Maistry but that is no reason to consider that he was not independent or that he was interested. In these circumstances it cannot be said that there were not present two witnesses at the time of sale and seizure of the adulterated oil.

"In the case of CITY CORPORATION, TRIVANDRUM *v.* ARUNACHALAM REDDIAR [1960 M.L.J. (Crl.) 595] certain observations upon which the learned Advocate for the accused relies were made to the effect that the non-compliance with the requirements of section 10 (7) of the Act was a serious irregularity which causes material prejudice to the accused. It may not be necessary to demure to those observations because if no mediators are present at the time when the sale takes place, the accused will be likely to be deprived by the absence of mediators who would lend assurance to the seizure. It is obvious that if witnesses are not present, it would given the accused a cause for complaining that the alleged sale of the adulterated oil by him and seizure by the Sanitary Inspector was not the same and consequently any finding relating thereto would not be binding on him. That, I think, is the object of the legislature in providing that there should be as far as possible,

at least two witnesses and it would be respected that those two witnesses would not have a direct connection with the Sanitary Inspector. In this case, P.W. 3 is an independent witness and though P.W. 2 is a maistry, there is nothing to show that he is, in any way, interested or was giving false testimony. That apart, the fact that there is only one independent witness assuming that P.W. 3 is only witness also does not vitiate the proceedings as observed by Their Lordships of the Supreme Court.

4. Master as well as servant or agent both liable.

Supreme Court Judgment.—Shah, J.—The appellant, Sarjoo Prasad was convicted by P. M. Aga, Magistrate, First-class, Allahabad, of an offence under section 7, read with section 16 of the Prevention of Food Adulteration Act, No. 37 of 1954—hereinafter referred to as the Act—and in view of a previous conviction for a similar offence was sentenced to suffer rigorous imprisonment for one year and to pay a fine of Rs. 2,000. The conviction and sentence were confirmed in appeal by the Court of Session at Allahabad and by the High Court of Judicature at Allahabad in revision. The appellant has appealed to this court with special leave under Article 136 of the Constitution.

(ii) The appellate was an employee of one Thakur Din who carries on business at 92-C, Mirganj, Allahabad, as a vendor of edible oils and provisions. On September 22, 1956, a Food Inspector of the Allahabad Municipality purchased from the appellant a sample of mustard oil exposed for sale in the shop which on analysis was found to be adulterated with linseed oil. Thakur Din and the appellant were prosecuted in the Court of the First-class Magistrate, Allahabad for selling adulterated food. The Magistrate convicted Thakur Din and the appellant and sentenced Thakur Din to pay a fine of Rs. 200 and the appellant to suffer rigorous imprisonment for one year and to pay a fine of Rs. 2,000.

(iii) The expression "sale" is defined by section 2 (xiii) in the Act as meaning sale of any article of food, whether for cash or on credit or by way of exchange and whether by wholesale or retail, for human consumption or use, or for analysis, and includes an agreement for sale, an offer for sale, the exposing for sale or having in possession for sale of any such article, and includes also an attempt to sell any such article. The definition includes not only actual sale but agreement for sale, offer for sale, exposure for sale and even possession of articles for sale and attempt to sell. The appellant was in charge of the shop at the time when mustard oil was sold to the Food Inspector. Mustard oil was exposed for sale and it was in the possession of the appellant and he actually sold it. But counsel for the appellant contends that by section 7 of the Act, the owner of a shop alone is prohibited from selling adulterated for a "person" against whom the prohibition operates. Counsel says that an employee in a shop who with knowledge that an article of food is adulterated, he is not liable to be punished for contravening the provisions of the Act. Section 7 of the Act in so far as it is material provides:

"No person shall himself or by any person on his behalf sell"

(i) any adulterated food;

.....".

The material part of section 16 (1) provides:—

"If any person, (a) whether by himself or by any person on his behalf sells any article of food in contravention of the provisions of this Act he shall or be punishable"

(iv) That the mustard oil sold by the appellant was adulterated has not been challenged in this appeal. The appellant's plea that the mustard oil delivered to the Food Inspector was not meant for sale was disbelieved by the Trial Magistrate and that view has been confirmed by the Court of Session and the High Court. The expression "person" has not been defined in the Act and in the context in which that expression occurs, it *prima facie* includes every one who sells adulterated food. By the collocation of the expression, "no person shall himself or by any person on his behalf", the employer alone is not prohibited. The intention of the Legislature is plain. Every person, be he an employer or an agent is prohibited by section 16 penalised. By section 19 in a prosecution for an offence pertaining to the sale of any adulterated article of food, it is no defence merely to allege that the vendor was ignorant of the nature of the substance or quality of the food sold by him. Such a defence can only succeed if the person charged with selling adulterated food proves that the article of food was purchased as of the same in nature, substance and quality as the demanded by the purchaser with a written warranty in the prescribed form, that he had no reasons to believe at the time when he sold it that the food was not of such nature, substance and quality and that he sold it in the same state as he purchased it, and he submits to the Food Inspector or the local authority a copy of the warranty with a written notice that he intends to rely upon it and specifies the name, address of the person from whom he received it. Prohibition of a sale of adulterated food is evidently imposed in the larger interest of maintenance of public health. The prohibition applies to all persons who sell adulterated food, and for contravention of the prohibition all such persons are penalised. Because the legislature has sought to penalise a person who sells adulterated food by his agent, it cannot be assumed that it was intended to penalise only those who may act through their agents. Of the owner of a shop in which adulterated food is sold is without proof of *mens rea* reliable to be punished for sale of adulterated food, we fail to appreciate why an agent or a servant of the owner is not liable to be punished for contravention of the same provision unless he is shown to have guilty knowledge.

(v) The argument that the Legislature could not have intended having regard to the fact that large majority of servants in shops which deal in food are illiterate to penalise servants who are not aware of the true nature of the article sold has in our judgment no force. The intention of the Legislature must be gathered from the words used in the statute and not on any assumptions about the capacity of the offenders to appreciate the gravity of the acts done by them. There is also no warrant for the assumption that the servants employed in shops dealing in food stuff are generally illiterate.

(vi) The legislature has in the interest of public health, enacted the Act and has provided that all persons are prohibited from selling adulterated food. In the absence of any provision, express or necessarily implied from the context, the courts will not be justified in holding that the prohibition was only to apply to the owner of the shop and not to the agent of the owner who sells adulterated food. The view taken to the contrary by the Madras High Court in *Re. S. Moses and another A.I.R. 1959 Mad. 185*, is in our judgment, erroneous.

(vii) There is no substance in the contention that the conviction of the appellant was not for a second offence committed by him under the Prevention of Food Adulteration Act. The prosecutor produced before the court an extract, dated April 7, 1956, of a judgment in criminal case No. 208 of 1956 which showed that one "Sarjoo Prasad" had been convicted by P. N. Jauhari, Magistrate, First-class, Allahabad, of the offence of adulteration of mustard oil and sentenced to pay a fine of Rs. 80. In the view of the Magistrate, the extract related to the appellant. The name of the person convicted and his father's name and residence were identical with the name of the appellant, his father's name and his residence. All the details given in the extract tallied

with the description of the appellant. In the memorandum of appeal filed to the Court of Session challenging the conviction recorded by the Magistrate, First-class, it was not contended that the person convicted in the earlier case was some person other than the appellant.

(viii) But the appellant was merely an employee of Thakur Din. It is not shown that he made himself any profit out of the transaction. Thakur Din has been sentenced to pay a fine of Rs. 200 only. The offence committed by the appellant is a repetition of a similar offence committed by him a few months earlier, but we think that having regard to all the circumstances, this is a case in which there are special and adequate reasons which would justify imposition of a penalty less than the minimum prescribed by section 16 (ii) of the Act. We reduce the sentence to imprisonment to three months and we remit the fine. Subject to this modification, the appeal is dismissed.

6. *The report of the Public Analyst cannot be brushed aside merely because, in some other case his opinion did not tally with that of the Central Food Laboratory—Andhra Pradesh High Court—Criminal Appeal No. 429 of 1959.*—The respondent was prosecuted for having been in possession of gingelly oil containing excess Free Fatty Acid. The Magistrate's Court acquitted him on the ground that the opinion of the Public Analyst was apt to be erroneous in view of the discrepancies in the analysis of a sample in a previous case by the Public Analyst and the Central Food Laboratory. The High Court allowed the appeal by the State holding that the learned Magistrate was wrong in importing the facts of a different case in the present proceedings. If the accused was not satisfied with the opinion of the Public Analyst he could have requested the court to send the sample to the Central Food Laboratory. In that case it would have been possible for the Court to base its conclusion on that report if it was favourable to the accused. But without resorting to that course, the learned Magistrate was not justified in basing his conclusion on the record of a previous case. The report of the Public Analyst has to be taken into consideration without calling him to substantiate it.

After quoting section 13 (5) in full His Lordship went on to observe: "In view of this clear provision of law, the Magistrate could not have brushed aside the report of the Public Analyst merely because in some other case his opinion did not tally with the Central Food Laboratory. The order of the learned Magistrate, is therefore, set aside".

7. *A Public Analyst's evidence based on tests which prove adulteration though not prescribed in the Rules may be accepted—Andhra Pradesh High Court Criminal Appeal No. 708 of 1959.*—The District Magistrate, Nuzvid, acquitted a vendor of the charge of storing for sale gingelly oil adulterated with 25 per cent of groundnut oil, on the ground that the Bellier's Test applied by the Public Analyst was not prescribed (at the time) and the Public Analyst failed to carry out saponification value and unsaponifiable matter. The High Court allowed the appeal by the State and ordered a retrial.

His Lordship observed: The learned Magistrate has discarded the opinion of the Public Analyst, as it did not contain saponification value and data regarding unsaponifiable matter, which the rules prescribed. I think, it has been done rather in a mechanical way without trying to realise and appreciate how the absence of this data affected the opinion of the Public Analyst. It has not also been ascertained why the application of Bellier's Test, which has now been made applicable to gingelly oil as well, was instrumental in leading to an incorrect conclusion. I think it was incumbent on the Magistrate, if he was not satisfied with the conclusion of the Public Analyst or had any difficulty in appreciating his finding, to summon the Analyst and seek a clarification instead of discarding his testimony as not confirming with the provision of the Act.

8. *The sale of an adulterated food includes not only sale for human consumption but also sale for use—Andhra Pradesh High Court—Criminal Appeal No. 452 of 1959.*—Allowing an appeal by the State against the acquittal of a vendor who sold adulterated asafoetida, the High Court gave a ruling that the sale of an adulterated food is an offence even when it is not intended for human consumption. The following is an extract from the judgment:—

"In the instant case the compounded asafoetida is itself an article of food as mentioned in Appendix 'B' and in accordance with section 7 it cannot be sold in an adulterated form. Sale, it be noted, is not confined to transactions for human consumption alone. The vending of articles for 'use' or for analysis has also been brought within its ambit, so that it cannot be urged that if an article of food is sold for use or for analysis, it need not conform to the prescribed standards of purity. To my mind to hold otherwise would be defeating the very purpose of legislation, viz., of providing articles of food in an unreasonably unadulterated form. If the argument for the learned counsel for the respondent is accepted it would provide an easy way of evading the law by claiming that any adulterated article of food sold was not meant for human consumption. The learned counsel for the respondent has also contended that the word 'use' should be construed as meaning for use of 'human beings for personal purposes'. But, I am not inclined to accept this construction and import words which do not find a place in the legislation. In my opinion, it would not have been necessary to employ the word 'use' after 'human consumption' if the idea to be conveyed was merely to confine it for use of human beings for personal purposes. I am inclined to accept the usual meaning that is attributed to the word 'use' so that in my opinion, the selling of this adulterated stuff (compounded asafoetida) even for any other purpose apart from human consumption would amount to contravening the provisions of the Act. I, therefore, hold that the provisions of section 2 (i) (a) have been contravened and the respondent is liable to punishment under section 16 of the Act."

9. *Plea that adulterated gingelly oil was kept in the vendor's shop for deeparadhana not accepted—Andhra Pradesh High Court—Criminal Appeal No. 87 of 1960.*—A wholesale and retail oil merchant was prosecuted by the Kavali Municipality for the offence of selling gingelly oil containing excess of Free Fatty Acid. The accused when first questioned by the Magistrate admitted the sale to the Food Inspector but stated that he did not commit the adulteration, but purchased the oil from another person. Later he charged this plea and stated that the oil was not intended for sale, but kept by him for "deeparadhana". The learned Magistrate accepted the plea and acquitted the accused. The High Court allowed the State appeal against the acquittal. The following is an extract from the judgment:—

The learned Magistrate has exhibited a poor sense of appreciation of evidence in readily accepting the testimony of these witnesses and in holding that there was room for doubt whether the accused was selling the gingelly oil in question as an article of food.

The evidence in the case leaves no room for doubt that the accused had stored gingelly oil in his shop for sale as an article of food. The sample taken by P.W. 1 was found to be adulterated. The accused is therefore clearly guilty of an offence under section 16 (1), read with section 7 of the Prevention of Food Adulteration Act. What the Trial Court has lost sight of is that if, in truth, the gingelly oil that sold to P.W. 1 was not kept there as an article of food or for purposes of sale, the accused would have, when questioned in the first instance, put forward that plea as already noticed. The stand taken by him at the outset was totally different from the stand he took later. Moreover, the Lower Appellate Court fell into grave error in discarding the evidence of P.Ws. 1 and 2 and in attaching importance to the perjure testimony of

D.Ws. 1 and 2, who, having figures as mediators at the time the oil was seized and sample taken—a requirement which the law imposes on Sanitary Inspectors—then tried to get over the proceedings to which they had been parties by giving false evidence. This is the kind of public co-operation that is forthcoming in putting down anti-social offences. It is a matter for regret, but that should not deflect the courts from their duty in discovering the truth and punishing the offenders.

I am satisfied that the reasoning on which the order of acquittal is passed by the lower Court is perverse.

I, therefore, allow this appeal, set aside the order of acquittal and convict the accused-respondent under section 16 (1) of the Prevention of Food Adulteration Act.

IN THE COURT OF THE CHIEF PRESIDENCY MAGISTRATE, MADRAS.

President: Sri R. Sadasivan, B.A., M.L.,
C.C. No. 13445 of 1960.

Drugs Inspector Complainant.

Versus.

1 Sreevatsa Chemicals and Drugs (Private) Limited Accused.

2 K. S. Murthy

Section 18 (a) (i) read with Sections 27 and 30 of the Drugs Act.

JUDGMENT, DATED 8TH DECEMBER 1960.

Complaint by the Drugs Inspector against accused Sreevatsa Chemicals and Drugs (Private), Limited and its Managing Director, Sri K. S. Murthy under section 18 (a) (i), read with section 30 of the Drugs Act.

2. P.W. 1, Sri T. S. Ramamurthy, Drugs Inspector, inspected the premises of Messrs. Sreevatsa Chemicals and Drugs (Private), Limited, on 9th December 1959 and took sample of Sodium Chloride, Batch No. 109, manufactured and kept for sale, and sent it to the Government Analyst, King Institute, Guindy. He got the report Exhibit P-1 that Sodium Chloride was not of standard quality as the sample did not contain the B.P. minimum of 99.5 per cent but only 97.8 per cent of Sodium Chloride calculated on dry basis. He deposed that the Sodium Chloride did not even satisfy the test as regards the limit of alkalinity and limit for calcium and magnesium and sodium chloride content. He is used show-cause notice Exhibit P-2 along with the Government Analyst's report to the accused and got the reply Exhibit P-3. In cross-examination he stated that according to the Analytical Register Exhibit D-1 maintained by the accused the sample contained 99.6 per cent of sodium chloride and that if it was correct it would conform to B.P. minimum.

3. P.W. 2 Sri K. R. Srinivasan, Government Analyst, King Institute, Guindy, deposed that he received sample of sodium chloride from P.W. 1 for analysis and gave the report Exhibit P-1. He deposed that the sample did not conform to the specification of sodium chloride laid down in British Pharmacopoeia. He deposed that sodium chloride was used for normal saline.

4. I questioned the accused under section 342, Criminal Procedure Code, in respect of the several circumstances appearing in the evidence against them. Accused 2 for himself and on behalf of accused 1 admitted that P.W. 1 took

sample of sodium chloride, batch No. 109 and that he received the report of the Government Analyst and sent reply. He, however, stated that according to his analysis the salt contained 99.5 per cent of sodium chloride and that he did not agree with the report of P.W. 2. He also filed a written statement.

5. I framed a charge under section 18 (a) (i), read with section 30 of the Drugs Act against accused 1 and under section 18 (a) (i), read with section 27 of the Drugs Act against accused 2 and read and explained the charges to the accused. The accused pleaded not guilty.

6. On the adjourned hearing date accused 2 for himself and on behalf of accused 1 stated that he did not want to further cross-examine P.Ws. 1 and 2 and that he did not want to examine any defence witness.

7. It is an undisputed fact that P.W. 1 Sri T. S. Ramamurthy, Drugs Inspector, inspected the premises of Messrs. Sreevatsa Chemicals and Drugs (Private), Limited, on 9th December 1959 and took samples of Sodium Chloride, Batch No. 109 stocked for sale sent it for analysis to the Government Analyst, P.W. 2 Sri K. R. Srinivasan and got the report Exhibit P-1. The report shows that the sample did not conform to the standard quality prescribed in the B.P. The accused relied on the analytical register Exhibit D-1 maintained by them to show that the salt conformed to the standards prescribed in the B.P. In their statement the accused have stated that the analysis was conducted and recorded by a competent chemist approved by the Drugs Department. But the entries in Exhibit D-1 do not contain the signature of the chemist but only the signature of the accused. The chemist employed by the accused has not been examined as a witness in this case to prove how he analysed and tested the samples. Further the entry in Exhibit D-1 merely contains the final result, namely, the percentage of the drug in the substance without record of the details of the analysis to show that the entries in Exhibit D-1 are genuine. Further under section 25 (3) of the Drugs Act the report of the Government Analyst shall be evidence of the facts stated therein and such evidence shall be conclusive unless the person from whom the sample was taken has within twenty-eight days of the receipt of the report notified in writing the Inspector or the Court before which any proceedings in respect of the sample are pending that he intends to adduce evidence in controversion of the report. Even during the trial of the case I suggested to the accused that if they wanted to question the report Exhibit P-1, it was open to them under Clause 4 of the section 25 of the Drugs Act to send the sample M.O. 1 to the Central Drugs Laboratory for analysis. But the accused did not make any attempt to take advantage of the provisions contained in section 25 (4) of the Drugs Act.

8. The accused put forward several contentions as to why Exhibit P-1 should not be accepted in this case. The accused contended that P.W. 2 Sri K. R. Srinivasan did not conduct the analysis himself and that his assistant did the analysis. It is not possible for the Government Analyst to do the analysis in all cases. In fact Rule 45 of the rules framed under the Drugs Act states that "the Government Analyst shall cause the samples to be analysed or tested". It is therefore open to the Government Analyst to have the analysis of the samples done by his assistants.

9. The accused contended that the report of the Analyst was not in the prescribed manner as laid down in section 25 (1) of the Drugs Act and hence the report could not be taken as conclusive evidence under section 25 (3) of the Drugs Act. P.W. 2 Sri K. R. Srinivasan admitted in his evidence that he did only analysis and stated that tests were done only for biological and special products. In fact the word 'test' has been scored out in Exhibit P-1 and P.W. 1 Sri T. S. Ramamurthy also stated that there was only analysis and no test in this case and that test was done only for biological products. Even according to the dictionary the term 'test' does not include analysis. As the Government Analyst has done only analysis of the product, he could

not obviously give the protocols of test. But they are cases relating to biological products. Hence it could not be said that the report of Government Analyst is not in the prescribed manner as laid down in section 25 (1) of the Drugs Act.

10. The accused further contended that the report did not show the method by which the Analyst had arrived at the results. They argued that the report did not show whether the analyst took the prescribed quantity of the sample as per the specifications of B.P. The accused criticised the evidence of P.W. 2 Sri K. R. Srinivasan as vague as it did not show whether the sample was subjected to heat at 130° to constant weight before analysis was performed and the results calculated as per specifications of B.P. P.W. 2 Sri K. R. Srinivasan clearly stated in his evidence that the analysis was made and calculations were made on dry basis of the salt. He further stated that he adopted the B.P. methods of analysis. Thus in view of the evidence of P.W. 2 Sri K. R. Srinivasan that he adopted the method of analysis prescribed in the B.P., the objection of the accused that the report Exhibit P-1 does not disclose the method of analysis is without substance.

11. P.W. 2 Sri K. R. Srinivasan, gave evidence that he had brought the calculations made for the analysis together with the working sheet in respect of the analysis. He offered to give a copy of the records containing the details of the Analyst.

12. The next contention urged by the accused is that it was not possible for the sample to give static analytical results during different stages of manufacture, stock and sale and that the result of the Government Analyst could not be taken as valid retrospectively. In my opinion there is no substance in this contention. P.W. 2 Srinivasan deposed that he expected the same result even if the sample of Sodium Chloride was tested at different times. He stated that Sodium Chloride won't react on glass containers. He also stated that he had taken all precautions to avoid errors on account of personal factors of the Analyst. According to him variations on account of personal factors of the Analyst cannot lead to such difference as noticed in Exhibit P-1 and Exhibit D-1. He clearly stated that the sample in this case could not have given 99.6 per cent of Sodium Chloride by any Analyst. Thus it is clear from the evidence of the Government Analyst that the Sodium Chloride is a stable substance and that it won't give different dates.

13. For the foregoing reasons I am unable to accept the contention of the accused that the Government Analyst has not submitted the report in the prescribed form and that the contents of the report cannot be taken as conclusive evidence.

14. The accused contended that they were entitled to the protection under section 19 (2) (b) of the Drugs Act on the ground that they were not aware of the change that took place on account of any reaction between the contents and the container owing to efflux of time. Having regard to the evidence of the Government Analyst this contention cannot be accepted. Further the protection given under section 19 (2) (b) of the Drugs Act could be invoked only in cases where extraneous substance has unavoidably become intermixed with the drugs in the process of manufacture, preparation or conveyance. The protection under section 19 (2) (b) of the Drugs Act cannot therefore be claimed in respect of drugs which are not of standard quality. Thus in the case of Sodium Chloride a small quantity of iron or other manufacture and this intermixture would not render a person liable so long as the drug is otherwise of standard quality.

15. The accused contended that Sodium Chloride is a common product extensively used by every one and that Drugs Act cannot be made applicable to the product without evidence that it has been put to medical use. There

is no substance in this contention. Sodium Chloride has been manufactured and sold by the accused with label containing the words B.P. P.W. 2 Srinivasan deposed that Sodium Chloride is used for normal saline. Further the accused has used drug licence number for the preparation and it clearly shows that the preparation of the salt according to B.P. specification comes under the purview of the Drugs Act.

16. For the foregoing reasons I find the accused guilty as charged. Accused 2 representing admitted the prior convictions against accused 1. I therefore convict accused 1 under section 18 (a) (i), read with section 30 of the Drugs Act.

17. The only remaining question to be considered is one of sentence. The Sodium Chloride prepared by the accused did not contain B.P. minimum of 99.5 per cent of Sodium Chloride by only 1.7 per cent. But for the provisions contained in section 25 (3) of the Drugs Act, the small percentage could at least be partially be attributed to personal factors of the Analyst. It should be noted that it is not a costly preparation. Having regard to these facts I sentence accused 1 to pay a fine of Rs. 250 (two hundred and fifty rupees) and admonish accused 2.

Pronounced by me in open court.

(Signed) _____,
Chief Presidency Magistrate.

APPENDIX C.

STAFF.

Government Analyst	Sri K. R. Srinivasan, M.A., F.R.I.C.
Deputy Government Analyst	Sri K. Narayanaswamy, M.A., A.R.I.C.
Senior Assistants to Government Analyst.	Sri P. S. Nataraja Sarma, M.A.
	Sri K. Balasubramani m, B.Sc., Hons.
	Sri K. Ramachandran, M.A.
	Sri N. Srinivasan, M.A.
	Sri M. V. Narayanan, B.Sc., Hons.
	Sri G. Balasubramaniam, B.Sc., Hons.
	Sri S. A. Subramaniam, M.Sc.
	Sri V. Seshagiri Rao, B.Sc., Hons. (Tech.).
Junior Assistants to Government Analyst.	Sri S. Kasturi, M.A.
	Sri H. Packiam, M.A.
	Sri K. Sambandam, B.Sc.
	Sri P. Appavu, M.A.
	Sri P. Chandrasekara Rao, B.Sc., Hons.
	Sri V. Kondal Rao, M.Sc.
	Sri M. Kandiswamy B.Sc.
	Sri S. M. Sakalagunam, M.Sc.
	Sri V. V. Nithyanandam, B.Sc.
	Sri T. Bhavani Sankari, B.Sc.
	Sri B Srinivasan, B.Sc.
Technical Assistant	Sri C. Nandagopal.

During the year under report the following Junior Officers were on leave for the period indicated against each. Sri S. Kasturi, from 16th August 1960 to 27th September 1960, Sri K. Sambandam from 4th May to 2nd June 1960, Sri P. C. andrasekara Rao from 5th to 10th December 1960, 21st March to 10th May 1960, Sri V. Kondal Rao from 1st October 1960 to 12th January 1961, Sri M. Kandaswamy from 4th to 20th June 1960, Smt. V. R. Vimala from 31st March to 30th June 1960 and from 23rd to 30th July 1960, Sri S. M. Sakalagunam from 29th December 1960 to 4th January 1961; Smt. T. Bhavani Sankari from 22nd October 1960 to 31st January 1961, Sri Bhojarajan, S. Palni, S. Janakiram, D. C. Chelluraj acted for short periods in leave vacancies and Srimathi V. R. Vimala resigned on 9th August 1960.

APPENDIX D.

FINANCE.

Financial Statement of Government Analyst Department for the year 1960-61 (1st April 1960 to 31st March 1961).

1 Contribution to Government from local bodies in Madras State working the Prevention of Food Adulteration Act at Rs. 7-50 per sample.	88,658
Analysis fees for the samples received from local bodies in Andhra Pradesh at Rs. 20-00 per sample.	1,16,580
2 Estimated value for analysis done for Government Medical Institutions in Madras State and other State Government Departments.	74,700
3 Food samples from Government of India Departments..	780
4 Fees from unofficial sources for analysis of food samples in Madras State.	440
5 Estimated value for analysis of drugs from Hospitals and under the Madras Drug Rules, 1945, in Madras State	13,140
Total receipts ..	2,94,328

ESTIMATED EXPENDITURE.

1 Salaries and allowances of the staff of the Government Analyst.	1,14,079
2 Stores, Instruments and Chemicals including gas and water charges.	11,702
3 Contingencies	8,022
4 Electric current	2,000
5 Cost of stationery, clothing and printing	225
Total expenditure ..	1,36,028

APPENDIX E.

PREVENTION OF FOOD ADULTERATION ACT.

TABLE I.—Nature of samples received from the local bodies in Madras State and analysed in the Government Analyst's Laboratory 1960-61.

Nature of samples.	Total number of samples received and analysed.	Number reported.	Number adulterated.	Percentage adulterated.
(1)	(2)	(3)	(4)	(5)
Milk	6,367	2,719	1,341	49.3
Ghee	259	100	27	27.0
Butter	150	54	34	63.0
Gingelly oil	1,735	626	84	13.4
Cocconut oil	745	268	4	1.5
Groundnut oil	278	76	7	9.2
Coffee powder	913	389	21	5.4
Tea	217	97	33	33.0
Turmeric	322	125	7	5.6
Dhall and flours	590	216	9	4.2
Sweets	36	6	3	50.0
Honey	58	22	3	13.6
Vegetable oil products	13	5	1	20.0
Aerated water (sweet drinks).	34	22	7	32.8
Asafoetida	20	6	3	50.0
Miscellaneous	90	22	10	45.4
Total ..	11,826	4,753	1,593	3.5

TABLE II.—Samples taken in the Madras City and analysed in the Corporation Public Analyst's Laboratory.

Nature of samples from Madras City analysed by the Corporation Public Analyst during the year:—

Serial number and nature of samples.	Number of samples.	Number adulterated.	Percentage adulterated.
(1)	(2)	(3)	(4)
1 Milk	4,507	1,876	41.6
2 Ghee	853	75	8.8
3 Butter	590	83	14.1
4 Gingelly oil	1,087	107	9.8
5 Cocconut oil	377	13	3.2
6 Groundnut oil	149	14	9.4
7 Coffee powder	286	17	5.9
8 Tea	108	5	4.6
9 Turmeric	51	16	31.4
10 Dhall	93	39	41.9
11 Honey	8	1	12.5
12 Lozenges	2	1	50.0
13 Vegetable oil products	5	1	20.0
14 Miscellaneous—			
(a) Arrowroot	15	6	40.0
(b) Maida	21	3	9.5
(c) Chillies and chilli powder	3	1	33.3
(d) Atta	1	Nil.	Nil.
(e) Sooji	2	Nil.	Nil.
(f) Kesari powder	1	1	100.0
Total ..	8,161	2,257	27.7

TABLE III.—Samples of diet articles from Government Hospitals.

Samples.	Total number of diet articles received.
Milk	1,207
Coffee powder	967
Bread	885
Dhall	819
Sugar	656
Butter	613
Rice	456
Biscuits	420
Ghee	411
Gingelly oil	283
Cocoanut oil	269
Ragi flour	39
Jaggery	361
Barley	79
Arrow root flour	33
Tamarind	20
Honey	8
Native oil	3
Sago	16
Bee wax	1
Groundnut oil	1
Total	7,278

TABLE IV.—Sample examined in connection with Food—Poisoning Cases.

Source.	Nature of sample.	Number of samples received.
(1)	(2)	(3)
Municipal Health Officer, Pudukottai	Maida	1
Do. Erode	Do.	2
Do. Tuticorin	Do.	2
Do. Vellore	Do.	1
Do. Rajapalayam	Do.	2
Do. Devakottai	Do.	2
Do. Periyakulam	Do.	4
Do. Gobichettipalayam	Do.	1
Do. Rajapalayam	Do.	2
Do. Kodaikanal	Do.	7
Do. Rasipuram	Do.	13
Secretary, General Administration Department, Pondicherry.		
Do.	Bread	1
Municipal Health Officer, Mathurai	Corn Meal	1
Do. Do.	Wheat flour	1
Do. Do.	Wheat	1

TABLE IV.—Sample examined in connection with Food—Poisoning Cases.

Source.	Nature of sample.	Number of samples sent.
(1)	(2)	(3)
Health Officer, Corporation of Madras	Maida	1
Primary Health Centre, T. Omally, The Nilgiris District.	Do.	4
Health Inspector, Chengam West, N.A. District	Do.	1
Health Inspector, Tiruvarur	Mavilaku Mavu	1
Do.	Brown Sugar	1
Health Inspector, Nannilam	Do.	1
Do. Tanjore	Raw varagu	1
Do. Do.	Unpolished varagu rice	1
Do. Do.	Broken unclean varagu rice.	1
Health Inspector, Tiruchendur	Groundnut oil	3
Do. Tanjore	Varagu Husk	2
Do. Tirukoilur	Kuzhu	1
Do. Do.	Rice	2
Do. Do.	Ragi	1
Do. Do.	Groundnut oil	10
Do. Shankarapuram Range	Cooked poride	1
Do. Do.	Uncooked rice	1
Do. Do.	Uncooked ragi	1
Health Inspector, Kallakurichi Range	Boiled rice	1
Do. Do.	Cooked Ragi	1
Do. Do.	Uncooked Cholam	1
Do. Do.	Do. Varagu	1
Do. Do.	Do. Kembu	1
Do. Do.	Do. Ragi	1
Do. Do.	Do. used salt	1
Health Inspector, Villupuram West Range	Rice	1
Health Inspector, Tittagudi Range	Cooked Cholam	1
Do. Do.	Cholam	1
Health Inspector, Primary Health Centre, Katchirajapalayam.	Kambu	1
Do. Do.	Cooked Kambu	1
Health Inspector, Wandiwash Range	Groundnut oil	3
Do. Do.	Boiled rice	4
Do. Do.	Varagu	1
Do. Do.	Ragi	1
Do. Do.	Groundnut	3
District Health Officer, Tirunelveli	Heated groundnut oil	1
Do. Do.	Raw Groundnut oil	1
Do. Do.	Bengalgram flour	1
Do. Do.	Raw Rice	1
District Health Officer, N.A. Vellore	Puffee	1
Do. Do.	Jaggery Juice	1
Total		116

G.A.

TABLE V.—*Samples from Health Inspectors and Government Departments—Jails.*

Source.	Nature of sample.	Number of samples analysed.
(1)	(2)	(3)
Health Inspector, Rasipuram	Rosecoloured sago	2
	Lemon coloured sago	1
Health Inspector, Attur, Salem	Coffee powder	1
Health Inspector, Health Unit, Poonamallee	Brown sugar	1
	Chilli powder	1
Do. Do.	Blackgram dhal	1
Do. Do.	Boiled Rice	1
Do. Do.	Asafoetida	1
Do. Do.	Cocconut oil	1
Health Inspector, Berigai	D.D.T. Powder	2
Do. Hosur	Do.	2
Do. Attur	Molasses	1
Do. Namakkal	Sago flour wet	1
Do. Hosur	Milk powder	1
Do. Primary Health Centre, Mangur.	Do.	1
Health Inspector, Kolakulan Range	Do.	4
Government Milk Factory	Skimmed Milk powder	1
Do.	Milk powder	3
Do.	Milk powder (spoilt)	1
Do.	Skimmed Milk powder	1
Animal Room, King Institute, Guindy	Milk	1
Do.	Do.	2
Government Analyst, Trivandrum	Dhall	1
Forest Utilisation Officer, Madras-14.	Honey	2
Block Development Officer, Kotaiyam	Milk powder	1
Municipal Health Officer, Tirunelveli	Skimmed Milk Powder	1
Do. Kancheepuram	Maize	1
Do. Mathurai	Chicory powder (Spilt)	1
Do. Mathurai	Chicory roots	1
Do. Tuticorin	Chicory powder	1
Primary Health Centre, Bargur	Milk powder	2
Medical Officer, Primary Health Centre, Elavanasam.	Milk powder	1
Medical Officer, Primary Health Centre, Marugur.	Milk powder	1
Government Care Camp, Melapakkam, Avadi	Chilli powder	1
Do.	Coriander powder	1
District Health Officer, Salem	Coloured sago powder	1
Do. Tanjore	Skim Milk powder	1
Do. Do.	Do.	1

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School and Jails.

Milk	3
Ragi	2
Wheat	1
Gingelly oil	4
Boiled rice	1
Coffee powder	1
Bread	1
Teor Dhall	1
	14

TABLE VI.—*Food samples from Private source.*

Source.	Nature of sample.	Number of samples received.	Results of analysis.
Century Flour Mills, Madras-1	Maida	1	..
State Trading Corporation of India (Ltd.), Madras-1.	Skimmed milk powder	1	Unfit for human consumption.
Mr. R. E. Chambers, Casta Rice Consulate-General, Madras-1.	Full Cream condensed milk.	2	..
Buhari Stores, Pharmacy, 4/17, Mount Road, Madras-2.	Butter	1	10.8 per cent excess moisture. 76 per cent Foreign fat.
Md. Ibrahim Staroj Co., Melapalayam, Tirunelveli District.	Gingelly oil	2	One sample contained 5.8 per cent Free Fatty Acid.
Engineering College Hostel, Anapattur.	Ghee	1	Contained 13.5 per cent foreign fat.
Sri Murugam Oil Mills, Tirukali-kundram.	Gingelly oil	1	..
Sri Satvanarayanan Contractor, Rajaji Street, Kakinada.	Dhall	1	..
R.M.O., S.M.T.B.S., Santhosapuram, Tambaram, Chromepet Post.	Milk	1	Contained 45 per cent of added water.
Mani & Co., Coffee Works, Villupuram.	Butter	1	6.8 per cent excess moisture.
CARE. Manager, 8, West Cott Road, Madras-14.	CARE milk powder	1	..
High Coffee, Tea Factory, Coonoor P.O.	Tea	1	..
Secretary, The South Indian Chamber of Commerce, Madras-1.	Groundnut oil	4	Did not conform to specification regarding Free Fatty Acid.
Brooke Bond India Private Ltd., Madras-4.	Tea	3	Mixed with coal tar dyes.
M. Vaman Kamath Cam, Bazaar, Cannanore.	Cumin seed	1	..
	Total	22	

TABLE VII.—*Samples of Vanaspathi analysed under the Vegetable Oil Product Control Order.*

Serial number and samples received from.	Brand of Vanaspathi.
1 Salem	Dalda Vanaspathi.
2 Tanjore	Lion Brand Vanaspathi.
3 Tiruchirappalli	Kamathenu Vanaspathi.
4 Madurai	O. K. Vanaspathi.
5 Do.	Do.
6 Tirunelveli	Dalda Vanaspathi.
7 Nagercoil	Do.
8 Madras-4.	O.K. Vanaspathi.
9 Coimbatore	Kamathenu Vanaspathi.
10 Chingleput	Lotus Brand Vanaspathi.

All of them were reported as conforming to prescribed standards.

TABLE VIII.—Government of India Departments.

Source.	Nature of samples.	Number of samples received.	Number reported adulterated or otherwise unsatisfactory.
(1)	(2)	(3)	(4)
Port Health Officers, Madras ..	Chicory powder ..	1	..
Do. ..	Glucose powder ..	1	..
Do. ..	Unicef Milk powder ..	5	2
Do. ..	Skim Milk powder ..	1	..
Chief Commercial Superintendent, Tiruchirappalli.	Boiled Rice ..	2	2
Station Master, Tiruppur ..	Jawari mineal with acid	1	1
Commercial Inspector, Southern Railway, Madras.	Burru ..	1	..
Chief Commercial Superintendent, Tiruchirappalli.	Tea ..	1	1
Do. ..	Peas dhal ..	3	3
Chief Commercial Superintendent, P.T., Madras.	Jeera seeds white ..	1	..
Headquarters Office (Commercial) Catering, Branch Madras.	Refined groundnut oil ..	1	..
Station Master, Southern Railway, Tiruppur.	Jawari ..	2	..
Headquarters Officer (Commercial) Catering Branch, Madras.	Refined groundnut oil ..	1	..
Deputy C.M. Engineer, Golden Rock (Southern Railway).	Sugar (poison) ..	1	..
Chief Commercial Superintendent, Tiruchirappalli.	Peas dhal ..	2	2
Headquarters Office, Commercial Branch, P.T., Madras.	Jeera seeds white ..	1	..
Station Master, Southern Railway, Palayamkottai.	Corn (Cholam) ..	2	..
Headquarters Office (Commercial) Catering Branch, Madras.	Toor Dhal ..	3	3
Chief Commercial Superintendent, Tiruchirappalli.	Rice damaged ..	1	1
Chief Commercial Superintendent, Tiruchirappalli.	Soda ash ..	3	3

Out of 5 samples of Unicef Milk powder sent by Port Health Officer, Madras, two samples of milk powder contained high proportions of insoluble matter and show evidence of ageing and were therefore declared unfit for human consumption.

Southern Railway—

Two samples of boiled rice were reported as unfit for human consumption since they contaminated with about 0.8 per cent tar oil not removable by washing.

A sample of Jawari was reported as unfit for human consumption since it was contaminated with sulphuric acid.

A sample of Tea was reported as unsuitable for human consumption since the sample has mouldy and had decayed considerably.

Five samples of peas dhal were reported as unfit for human consumption since they contaminated with sulphuric acid.

Out of 8 samples of Toor dhal 5 samples were reported as not satisfactory since the samples contained an added colouring matter derived from coal tar.

A sample of rice was reported as unfit for human consumption since it emitted a strong musty odour and was infested with worms and insects.

Three samples of soda ash received were reported they had lower sodium carbonate content due to a lack of moisture.

TABLE IX.—Statement showing number of samples analysed etc., during the year 1960-61.

Particulars of samples drawn for examination.	Number of samples brought forward from previous year.	Number received of drugs samples during 1960-61.		Number reported standard quality.	Number reported not of Standard quality.	Number rejected for various reasons.	Number pending with Analyst.
		From Drugs Inspector.	From other sources.				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vitamin	44	47	22	35	7	3	68
Hormones	3	..	3	5	..	..	1
Antibiotics ..	2	1	3	4	..	..	2
Penicillin ..							
Streptomycin							
Chloramphenicol							
Insulin	..	..	..	..	..	..	..
Biological Products.	..	1	..	..	..	..	1
Chemotherapeutic ..	7	2	5	10	..	..	4
Galenicals	13	16	6	11	9	..	15
Others	167	174	158	154	144	7	194
			(including 1 from AP).				
Grand Total ..	236	241	197	219	160	10	285

TABLE X.—Pharmacopoeial drugs reported upon during 1960-61 (Table II).

Name of Drug.	Total.	Not of Standard Quality.
(1)	(2)	(3)
Eucalyptus oil ..	54	..
Absorbent gauze ..	7	1
Absorbent Cotton Wool ..	2	..
Tinctures ..	12	7
Glucose ..	1	1
Liquid paraffin ..	2	1
Pulv-light Kaolin ..	1	1
Boric Acid ..	2	1
Sulpha drugs Tabs ..	5	..
Sodium Chloride ..	2	2
Total ..	88	14

TABLE XI.—Classified list of proprietary drugs reported upon, during 1960-61 (Table).

Name of Drug. (1)	Total (2)	Not of Standard Quality. (3)
Antiseptic applications	3	1
Oral Vitamin Preparation	13	2
Analgesics and Applications	4	1
Cough remedy	2 (including Epitron Hydro- chloride).	..
Gripe-water and Antacid	6	3
Mineral and liver tonics	1	..
Fever cure	1	1
Parental (Vit.)	4	1
Misc. (Laxant Vik's inhaler (3) comlax upercardial Mandl Seidlity.	8	2
		(1 com ax vik's).
Total ..	42	10

TABLE XII.—Particulars of samples of drugs from Government Hospitals and other Government Institutions reported upon, after analysis during the year 196-61.

Serial number and name of the Drug. (1)	Defects noted. (2)
<i>Government General Hospital, Madras.</i>	
1 Mist. Carminative .. .. .	....
2 Mist. Quin Sulphas	19.4 per cent Excess Quin Sulphas.
3 Mist. Asthmatica	K. I. 36 per cent Excess, K.Br. 14 per cent Excess Am. Carb. 28 per cent deficient.
4 Mist. Pot. Iodide .. .. .	....
5 Mist. Soda Salicylas	Sed. Sal. 12 per cent Excess, Soda Bicarb.
6 Vitamin B. 12 .. .. .	....
7 Mist. Carminative	Sed. Bicarb 15.3 per cent excess.
8 Mist. Soda Salicylas .. .. .	....
9 Mist. Bismuth et soda	Bicarb 33.5 per cent excess Sod. Bicarb 13.0 per cent Excess.
10 Mist. Asthmatica .. .. .	....
11 Mist. Heposal	Shark liver oil 113 per cent Excess.
12 Calcium Gluconate Inj. 10 c.c. .. .. .	....
13 Prednisolone Tabs .. .. .	....
14 B12 Injection 1 c.c. .. .. .	....
15 Sulphathiazole Tabs .. .. .	....
16 Phenobarbitone .. .. .	....
17 Sod. aminosalicylate .. .. .	....
18 Sulphamilmide .. .. .	....
19 Nikeramide 2 c.c. .. .. .	....
20 Sulphagranidine .. .. .	....

TABLE XII.—Particulars of samples of drugs from Government Hospital and other Government Institutions reported upon, after analysis during the year 1960-61—cont.

Serial number and name of the drug. (1)	Defects noted, (2)
<i>GOVERNMENT GENERAL HOSPITAL, MADRAS—cont.</i>	
21 Epitron Hydro Chloride .. .. .	....
22 Prednisolone tabs. 5 mg. .. .. .	....
23 Vitamin C tabs. 50 mg. .. .. .	....
24 Chloramphenicol capsules 250 mg. .. .. .	....
25 Vitamin C Tabs .. .. .	....
26 Vitamin B Complex .. .. .	....
27 Vitamin C Tablets .. .. .	....
28 Multi Vitamin Tablets .. .. .	....
29 Prednisolone 5 mg. .. .. .	....
30 Vitamin B Complex tablets .. .. .	....
31 Mist. Soda Salicylas	Soda Bicarb 24 per cent deficient Spt. Am. Arom. 39 percent deficient.
32 Mist. Carminative	Spt. Am. Arom. 44 per cent Excess.
33 Mist. Sedative Expectorant	Soda Bicarb 16 per cent Excess.
34 Mist. Quin Sulphas .. .. .	....
35 Aminophylline 10 ml. (25g.) .. .. .	....
36 Vitamin B Complex 1 c.c. .. .. .	....
37 Vitamin B12 (50 mcg.) .. .. .	....
38 Vitamin B1 (50 mg./cc. .. .. .	....
39 Vitamin K 10 mg. cc.) .. .. .	....
40 Folic Acid 100 cc. vial 15 mg. .. .. .	....
41 Vitamin K 10 mg/cc. .. .. .	....
42 Vitamin C Complex Inj. 1 cc amp .. .. .	....
43 Do. .. .. .	....
44 Vitamin C Injection 100 mg/cc. .. .. .	....
45 Aminophylline tablets .. .. .	....
46 Vitamin C Tablets 50 mg/tab. .. .. .	....
47 Para amino salicylate Tabs. 5 g/tab. .. .. .	....
48 Prednisolone 5 mg/tab. .. .. .	....
49 Betopil Inj. 1 ml. .. .. .	....
50 Diethyl Carbamazone .. .. .	....
51 Vitamin C Tablets 50 mg/tab .. .. .	....
52 Enteromycetin Caps. 250 mg. .. .. .	....
53 Prednisolone Tablets .. .. .	....
54 Mist. Quin Sulphas	Quin Sulphas 27 per cent deficient.
55 Mist. Carminative	Sod. Bicarb 16 per cent deficient.
56 Mist. Soda Salicylas .. .. .	....
57 Mist. Sedative Expectorant	Sod. Bicarb 32 per cent Excess.
58 Mist. Carminative	Spt. Am. Arom. 48 per cent deficient.
59 Mist. Soda Salicylas	Sp. Am. Arom. 36 per cent deficient.
	Soda Bicarb 46 per cent deficient.
60 Mist. Asthmatica	Am. Bicarb 100 per cent deficient.
	KI 26 per cent deficient.
61 Mist. Asthmatica	Am. bicarb 126 per cent Excess K. Br. 47 per cent deficient.
62 Mist. Sedative Expectorant .. .. .	....
63 Mist. Heposal	Shark liver oil 18 per cent deficient.
64 Mist. Soda Salicylas	Sod. bicarb 26 per cent deficient.

TABLE XII—Particulars of samples of drugs from Government Hospital and other Government Institutions reported upon, after analysis during the year 1960-61—cont.

Serial number and name of drug. (1)	Defects noted. (2)
GOVERNMENT HOSPITAL FOR WOMEN AND CHILDREN, EGMORE, MADRAS-8.	
65 Mist. Carminative .. .. .	....
STANLEY HOSPITAL, MADRAS.	
66 Formelin .. .. .	....
67 Para Amino Salicylate Tablet USP. ..	....
R.S.R.M. LYING-IN-HOSPITAL.	
68 Mist. Alk. Diuretica	Pot. bicarb 13.9 per cent excess. Pot. citrate 66 per cent deficient.
69 Mist. Carminative .. .. .	....
70 Mist. Soda Salicylas .. .. .	....
71 APC Tablets	Dehydrated Unfit for use.
72 Mist. Carminative	Soda bicarb 16 per cent deficient.
73 Mist. Alk. Diuretica	Pot. Citrate 18.7 per cent deficient.
74 Mist. Soda Salicylas	Sod. Bicarb 21 per cent deficient.
KASTURBA GANDHI HOSPITAL FOR WOMEN AND CHILDREN, MADRAS.	
75 Mist. Sedative Expectorant .. .. .	....
76 Mist. Alk. Diuretica .. .. .	....
77 Mist. Carminative	Sp. Am. Arom. 120 per cent Excess.
78 Mist. Diaphoretica .. .. .	....
79 Mist. Carminative	Sp. Am. Arom. 43 per cent deficient. Sod. bicarb 31 per cent deficient.
80 Ether for Anesthesia .. .. .	....
81 Mist. Carminative	Sp. Am. Arom. 36 per cent deficient. Soda bicarb 22 per cent deficient.
82 Mist. Alk. Diuretica	Soda bicarb 18 per cent deficient.
83 Mist. Triple Sulphas	Quin sulphas 20 per cent Excess.
84 Mist. Sedative Expectorant	Soda bicarb 42 per cent Excess.
85 Mist. Soda Salicylas	Soda salicylas 34 per cent deficient
86 Mist. Uterine Sedative .. .. .	....
E.S.I. HOSPITAL, POONAMALLE HIGH ROAD, MADRAS.	
87 Mist. Carminative	Soda bicarb 34 per cent deficient. Sp. Am. Arom. 65.6 per cent Excess.
88 Mist. Alk. Diuretica	Soda bicarb 15.0 per cent deficient. Sod. citrate 71 per cent deficient.
89 Mist. Diaphoretica	Sp. Am. Arom. 49 per cent deficient. Sp. Ac. Nit. 31 per cent deficient. Pot. citras 118 per cent Excess. Lil. Am. Ac. 137 per cent Excess.
90 Mist. Quin sulphas	Quin sulphas 22 per cent deficient. Acid sulph. dil. 25.5 Excess.
91 Mist. Chloral Bromide .. .. .	....
92 Sod. PAS Tablets : .. .. .	....

TABLE XII—Particulars of samples of drugs from Government Hospital and other Government Institutions reported upon, after analysis during the year 1960-61—cont.

Serial number and name of the drug. (1)	Defects noted. (2)
E.S.I. HOSPITAL, KILPAUK.	
93 Mist. Sedative Expectorant	Sod. bicarb 35.2 per cent deficient.
94 Mist. Soda Salicylas	Sod. Sal. 25 per cent deficient. Soda bicarb 53 per cent deficient.
STATE INSURANCE DISPENSARY, ROYAPURAM.	
95 Quin Sulphas	Quin sulph nil.
E.S.I. HOSPITAL, METTUR DAM.	
96 Calc. Gluconate Inj. 10 per cent .. ..	....
97 Syrup Codeine .. .. .	....
T. B. SANATORIUM, TAMBARAM.	
98 Mist. Soda Salicylas	Sod. Sal. 37 per cent Excess. Sp. Am. Arom. 28 per cent deficient. Soda bicarb 19 per cent deficient.
99 Mist. Alk. Beeladonna .. .. .	....
100 Mist. Carminative	Sp. Am. Arom. 27 per cent deficient. Soda bicarb 11 per cent deficient.
101 Mist. Soda Salicylas	Sod. Sal. 16 per cent deficient. Sp. Am. Arom. 31 per cent deficient.
102 Mist. Sedative Expectorant	Soda bicarb 49.0 per cent Excess.
103 Mist. Carminative	Soda bicarb 24 per cent Excess.
104 Mist. Bromide	Soda bromide 28.0 per cent Excess.
105 Sod. Bicarb .. .. .	....
106 APC Tablets .. .. .	....
107 Mist. Soda Salicylas .. .. .	....
108 Mist. Carminative .. .. .	....
DIRECTOR OF MEDICAL SERVICES, MADRAS.	
109 Absorbent Cotton Wool BPC .. .. .	....
110 Tablet Hypodermic Morphine Sulphate.	....
DIRECTOR, KING INSTITUTE OF PREVENTIVE MEDICINE, CHETPUT.	
111 Tr. Benzoin Co.	60 per cent deficiency in total Solids.
112 Am. Sulphate	50 ppm. Arsenic.
113 Do.	7 p.p.m. Arsenic.
DIRECTOR, T.B. INSTITUTE, CHETPET.	
114 Compd. Vitamin Tablets	Deteriorated; Vit. C and Nicotinamide absent.
SUPERINTENDENT, CENTRAL JAIL, MADRAS.	
115 (1) Cresylic acid	Tara acid deficient.
116 (2) Cresylic acid	Tara acid deficient.
117 (3) Cresylic acid .. .. .	....

TABLE XII.—Particulars of samples of drugs from Government Hospital and other Government Institutions reported upon, after analysis during the year 1960-61—cont.

Serial number and name of drug. (1)	Defects noted. (2)
SUPERINTENDENT, GENERAL JAIL, MADRAS—cont.	
118 (4) Cresylic acid .. .. .	....
119 Cresylic acid .. .. .	....
120 Do. .. .. .	....
121 Do. .. .. .	....
DISTRICT MEDICAL OFFICER, CHINGLEPUT.	
122 Mist. Asthmatica	Pot. Iodide 18 per cent deficient. Am. Carb. 24 per cent deficient.
123 Mist. Carminative	Soda bicarb 32 per cent deficient. Sp. Am. Arom. 30 per cent deficient.
124 Mist. Quin Sulphas	Quin sulphas 32 per cent deficient. Acid sulph dil 20 per cent deficient.
125 Mist. Soda Salicylas	Sp. Am. Arom. 27 per cent deficient. Soda bicarb 21 per cent deficient.
126 Mist Sod. Bromide	Sod. Br. 22 per cent deficient.
127 Mist. Pot. Iodide	Pot. Iodide 22 per cent deficient. Sp. Am. Arom. dil. 47 per cent deficient.
128 Mist. Pot. Iodide	Sp. Am. Arom. 28 per cent deficient.
129 Mist. Quin sulph	Acid dil sulph 32 per cent Excess.
130 Mist. Carminative	Sp. Am. Arom. 60 per cent Excess.
131 Mist. Soda Salicylas	Sod. Sal. 32 per cent Excess. Soda bicarb. 34 per cent excess. Sp. Am. Arom. 76 per cent Excess.
GOVERNMENT LEPROSY SUBSIDY CENTRE, TRIVELLORE.	
132 Mist. Carminative	Soda bicarb 100 per cent Excess.
133 Mist. Soda Salicylas	Sod. Sal. 30 per cent excess.
GOVERNMENT CHINGONA HOSPITAL, ANOAMALAI.	
134 Olive oil	100 per cent Groundnut oil.
GOVERNMENT HOSPITAL, KANCHEEPURAM.	
135 Mist. Influenza	Sod. Sal. 52 per cent deficient. Soda bicarb 48 per cent deficient. Am. Carb. 44 per cent deficient. Total Ammonia 62.7 per cent deficient.
136 Mist. Asthmatica	Pot. Iodide 53.4 per cent deficient. Sod. Bromide 54.0 per cent deficient.
GOVERNMENT HOSPITAL, SIYAGANGA.	
137 Hydrargi subchloride .. .. .	....
GOVERNMENT DISPENSARY, KANADUKATHAN.	
138 Mist. Diaphoretica	Pot. Citrate 42.6 deficient, Spts. Ae. nitros 100 per cent deficient. Spts. Am. Arom. 62 per cent deficient.

TABLE XII.—Particulars of samples of drugs from Government Hospitals and other Government Institutions reported upon, after analysis during the year 1960-61—cont.

Serial number and name of drug. (1)	Defects noted. (2)
GOVERNMENT DISPENSARY, KANADUKATHAN—cont.	
139 Mist. Asthmatica	Pot. Iodide 16 per cent deficient. Sod. Brom. 29.8 per cent deficient. Sps. Chloroform absent.
GOVERNMENT HOSPITAL, VILLUPURAM.	
140 Mist. Soda Salicylas	Sod. Sal. 21.6 per cent excess. Soda bicarb 13.8 per cent excess.
DISTRICT MEDICAL OFFICER, SALEM.	
141 Mist. Asthmatica .. .. .	....
142 Mist. Totaquinine .. .. .	....
143 Mist. Soda salicylas .. .. .	....
HEADQUARTERS HOSPITAL, CUDDALORE.	
144 Mist. Sedative Expectorant	Sod. bicarb 51 per cent excess.
145 Mist. Alk. Diuretica .. .. .	....
146 Mist. Carminative	Sp. Am. Arom. 36.6 per cent excess.
147 Mist. Soda Salicylas	Sod. bicarb 35 per cent deficient. Sod. Sal. 27.5 per cent Excess.
DISTRICT MEDICAL OFFICER, SOUTH ARCOT, CUDDALORE.	
148 Mist. Carminative	Sp. Am. Arom. 53 per cent deficient. Soda bicarb 56 per cent deficient.
149 Mist. Soda Salicylas	Sod. Sal. 78 per cent deficient. Soda bicarb 84 per cent deficient.
GOVERNMENT HOSPITAL, KRISHNAGIRI.	
150 Mist. Quin Sulph .. .. .	....
151 Mist Soda Salicylas .. .. .	....
152 Mist. Quin Sulph.	Acid Sulph dil. 162 per cent excess.
153 Mist. Soda Salicylas .. .. .	....
MEDICAL OFFICER, GOVERNMENT HOSPITAL, TIRUPATHUR.	
154 Medimycetin (Chlorophenical caps 250 mg.) .. .. .	....
TOWN GENERAL HOSPITAL, PUDUKOTTAI.	
155 Mist. Ferri sulphas .. .. .	....
156 Mist. Carminative (conc)	Sp. Am. Arom. 31.4 per cent excess.
157 Mist. Soda Salicylas	Sod. bicarb 32.0 per cent deficient.
158 Mist. Soda Salicylas .. .. .	....
159 Mist. Alk. diuretica .. .. .	....
160 Mist. Acid tonic .. .. .	....
161 Mist. Carminative .. .. .	....

TABLE XII—Particulars of samples of drugs from Government Hospitals and other Government Institutions reported upon, after analysis during the year 1960-61—cont.

Serial number and name of drug. (1)	Defects noted. (2)
GOVERNMENT HOSPITAL, PATTUKOTTAI.	
162 Mist. Soda Salicylas	Sod. Sal. 15 per cent excess. Soda bicarb excess.
163 Mist. Quinine	Acid. sulph. dil. 20 per cent excess.
PUBLIC HEALTH CENTRE, PERAMBAKKAM.	
164 Mist. Diaphoretica	Sp. Am. Aromaticus 324 per cent excess. Pot. N.trate 25 per cent deficient. Sod. Acitate 67 per cent deficient.
165 Mist. Carminative	Sod. bicarb 39 per cent deficient.
166 Mist. Alk. Belladonna	Sod. bicarb 41 per cent deficient.
GOVERNMENT HOSPITAL, PADMANABHAPURAM.	
167 Mist. Carminative	Sod. Bicarb 18 per cent deficient. Sp. Am. Arom. 57 per cent deficient.
168 Mist. Soda Salicylas	Sp. Am. Arom. 21.3 per cent deficient.
169 Mist. Sedative Expectorant .. .. .	....
GOVERNMENT HOSPITAL, TUTICORIN.	
170 Mist. Asthmatica	Am. Carb. 34 per cent deficient. Pot. Iodide 50 per cent deficient. Pot. Br. 27 per cent deficient.
171 Mist. Soda Salicylas	Sod Sal. 19 per cent deficient. Sod. bicarb 56 per cent.
172 Mist. Quin sulphas	Quin Sulphas 29 per cent deficient. Acid Sulphuric dil. 19 per cent deficient.
173 Mist. Carminative	Sp. Am. Arom. 32 per cent deficient. Soda bicarb 41 per cent deficient.
174 Mist. Flu.	Soda Sal. 64 per cent deficient. Sod. bicarb 36 per cent deficient. Total Ammonium 46 per cent deficient.
GOVERNMENT HOSPITAL, NAGAPATTINAM.	
175 Mist. Carminative	Sod. Bicarb 26 per cent excess.
176 Mist. Soda Salicylas	Sod. Sal. 12 per cent excess. Soda bicarb 42 per cent excess.
177 Enteromycetin (Chlorophenicol Caps. 250 mg.).	....
GOVERNMENT HOSPITAL, KALLAKURICHI.	
178 Mist. Soda Salicylas .. .. .	....
179 Mist. Carminative .. .. .	....
180 Mist. Quin sulphas	Acid Sulphuric Dil. 19 per cent deficient.

TABLE XII—Particulars of samples of drugs from Government Hospitals and other Government Institutions Reported upon, after analysis during the year 1960-61—cont.

Serial number and name of drug. (1)	Defects noted. (2)
T. B. HOSPITAL, NAGARCOIL.	
181 Mist. Alba	Mg. Carb. 20 per cent deficient. Mf. sulph. 66.7 per cent excess.
182 Mist. Acid tonic	Acid Nitro Hydrochloric dil. 50 per cent excess.
183 Mist. Asthmatica	Am. C-rb. 36 per cent Sod. Br. 244 per cent excess.
184 Mist. Bismuth	Bi. Carb. 75 per cent excess.
185 Mist. FAC	Acid Nitro Hydrochloric dil. 64 per cent excess.
186 Mist. Carminative	Sod. bicarb 16 per cent deficient. Sp. Am. Arom. 33 per cent excess.
187 Mist. Ferri sulphas	Ferri sulphas 33 per cent excess. Sulphuric dil 91 per cent excess. Sp. Am. Arom. 24.5 excess.
188 Mist. Soda Salicylas .. .. .	....
189 Mist. Sedative Expectorant	Ol. Shark liver 17 per cent deficient.
190 Mist. Heporal	Soda Br. 17 per cent deficient.
191 Mist. Asthmatica	Am. bicarb 18 per cent deficient. Soda bicarb 31 per cent deficient.
192 Mist. Carminative	Ferri sulph 182 per cent excess.
193 Mist. Ferri sulph	Sulphuric dill. 84.8 per cent Excess.
194 Pulvis APC .. .. .	....
ASSISTANT DISTRICT MEDICAL OFFICER, NAGERCOIL.	
195 Mist. Soda Salicylas	Sod. bicarb 54 per cent deficient. Sp. Am. Arom. 18 per cent deficient.
DISTRICT MEDICAL OFFICER, KANYAKUMARI.	
196 A mixture (Quinine sulp.) .. .. .	....
T. B. HOSPITAL, NAGERCOIL.	
197 Mist. Asthmatica	Am. Car. 60 per cent excess. Sod. Br. 18 per cent deficient.
GOVERNMENT HEADQUARTERS HOSPITAL, NAGERCOIL.	
198 Mist. Carminative .. .. .	....
GOVERNMENT HEADQUARTERS HOSPITAL, NAGERCOIL.	
199 Mist. Soda Salicylas .. .. .	....
CIVIL ASSISTANT SURGEON, GOVERNMENT HOSPITAL, DINDIGUL.	
200 Mist. Carminative	Sod. bicarb 14.6 per cent deficient. Spt. Am. Arom. 56 per cent deficient.

TABLE XII—Particulars of samples of drugs from Government Hospitals and other Government Institutions Reported upon, after analysis during the year 1960-61—cont.

Serial number and name of drug.	Defects noted.
(1)	(2)
201 Soda Salicylas Mist.	Sod. Sal. 48 per cent deficient. Sod. bicarb 66 per cent deficient. Spt. Am. Arom. 61 per cent deficient.
202 Mist. Alk. diuretica	Sod. Acet. 75 per cent deficient. Sod. b carb 65 per cent deficient.
203 Mist. Carminative	Sp. Am. Arom. 26 per cent deficient. Soda bicarb 64 per cent deficient.
204 Mist. Soda Salicylas	Sod. Sal. 34 per cent and Soda bicarb 85 per cent deficient.
205 Quin Mixt.	Quin sulph 62 per cent deficient. Acid sulph dil. 66 per cent deficient.

TABLE XIII.—Particulars of samples of drugs under the act reported as not of standard quality during 1960-61.

Received from.	Name of drug.	Nature of preparation.	Defect noted.
(1)	(2)	(3)	(4)
1 Drugs Inspector, Tirunelveli.	Exmol.	Antiseptic application.	Salicylic acid 64.9 per cent deficient.
2 Drugs Inspector, Thanjavur.	Al tobex	Vitamin oral ..	Folic acid 60 per cent deficient.
3 Drugs Inspector, Madurai.	Light Kaolin Pulv BP ..	Pharmacopoeial ..	240 mgm. coarse particles in 5 g.
4 Drugs Inspector, Tiruchappalli.	B Complex Tab.	Vitamin oral ..	B1 20 per cent deficient.
5 Drugs Inspector, Madras.	Tr. Limonis IP 55	Pharmacopoeial ..	1. Total solids deficient. 2. Esils absent.
6 Do.	Tr. Auranti IP 55.	Do. ..	Does not comply with I P in total solids.
7 Do.	Tr. Gentian ..	Do. ..	(a) Wt./ml. .942 g. (b) total solids deficient.
8 Do.	Tr. Zinc Fortis BP 53	Do. ..	Total solids deficient.
9 Do.	Tr. Zinc Fortis BP. 53.	Do. ..	Total solids deficient.
10 Drugs Inspector, Madurai.	Ovens Gripe Dil Water.	....	Liq. Cal. Hyd. 40 per cent deficient.
11 Drugs Inspector, Madras.	Vick's inhaler (Spurious).	....	Drug content deficient.
12 Drugs Inspector, Vellore.	Liq. Paraffin ..	Pharmacopoeial ..	(1) wt./ml. @ 20° 848 g. (2) Sp. car. @ 20° 851 g. (3) Do. @ 25° 847 g.
13 Drugs Inspector, Madras.	Vick's inhaler ..	....	Drug content deficient.
14 Do.	UP B-com-super-forte.	Multivitamin ..	Riboflavin 22.7 per cent deficient.

TABLE XIII—Particulars of samples of drugs under the act reported as not of standard quality, during 1960-61.

Received from.	Name of drug.	Nature of preparation.	Defect noted.
(1)	(2)	(3)	(4)
15 Drugs Inspector, Thanjavur.	Complex ..	....	Saccharin not disclosed.
16 Drugs Inspector, Madras.	James Gripe stop water.	...	Do.
17 Do.	Do. ..	....	Do.
18 Drugs Inspector, Vellore.	Glucose ..	Pharmacopoeial ..	Mist. of sugarcane and rice starch.
19 Drugs Inspector, Madras.	Sod. Chlor. BP...	Do. ..	(1) Alkaline (2) Ca. Mg. present. (3) 98.0 per cent w/w. purity.
20 Do.	Sod. Chlor. BP...	Do. ..	(1) Alkaline. (2) Ca. mg. present. (3) Assay 98.1 per cent w/w.
21 Drugs Inspector, Salem.	Acid Boric BP...	Do. ..	Does not conform to BP.
22 Drugs Inspector, Madras.	Tr. Zing. Mitis. BP.	Do. ..	Total solids deficient.
23 Do.	Tr. Rhei Co. ..	Do. ..	(1) Rhubarb absent. (2) Glycerin absent. (3) Total solids deficient.
24 Drugs Inspector, Vellore.	Sanatanjan ..	Analystic application.	Misbranded.
25 Drugs Inspector, Ramnathapuram.	Abs. Gauze. ..	Surgical dressing.	Time of Satn. in water @ 25.4 minutes.

REPORT OF THE CHIEF WATER ANALYST.

REPORT OF THE CHIEF WATER ANALYST FOR 1960-61

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**THE ANNUAL REPORT OF THE CHIEF WATER ANALYST
FOR 1960-61.**

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Junior Water Analysts	Srimathi Jayakumari Swaminathan, B.Sc., B.Sc. (Tech)., Sri S. Rajagopalan, B.Sc., Sri R. M. Veerappan, B.Sc., Sri G. Chinnikrishnan, B.Sc., Sri K. Sankaran, B.Sc., Sri R. Srinivasan, B.Sc., Sri D. Bhojarajan, B.Sc., (from 1st July 1960). Sri J. Venkatakrishnan, M. sc. (from 16th November 1960).	
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Health Inspector	Sri P. K. Kannappan.	
Technical Assistant	Sri C. V. Aravamudhan.	
Technicians		3
Algae Collector		1
Laboratory Attendant Grade I		8
Laboratory Attendant Grade II		6
Laboratory Peons		5
Mazdoors		4

OFFICE.

Lower Division Clerk	1
Stenotypist	1
Typists	3

GENERAL.

The year under review was one of considerable difficulty arising from the unforeseen and large increase in the work following the transfer of the administrative control of the Laboratories from the Director of Medical Services to the Director of Public Health and the want of adequate staff to cope with the increased work. Proposals have been submitted to Government for the appointment of minimum additional ministerial staff and the provision of additional laboratory accommodation. In the G.O. No. 1218, dated 26th April 1960 Government have ordered that the services and facilities given to the Water Analysis Department by the King Institute previous to the transfer of administrative charge should be continued till 28th February 1962. This was however taken to apply only to the services other than ministerial, accounting, etc. With the result that the strain on the department was in no way relieved. A good part of the time of the scientific personnel had to be employed in transacting clerical work. They had to be at the writing table instead of at the work bench.

Another long standing difficulty which has been further aggravated in the last two years is the want of adequate laboratory space. Here again proposals have been made for constructing an extension to the present building. But as this is still pending sanction, the present rooms are getting more and more overcrowded.

In connection with the enquiries made by Dr. KRISHNA RAO COMMITTEE for the development of the Water Analysis Department, proposals were submitted for:—

- (1) The formation of a section of industrial wastes and sewage analysis;
- (2) The control of the hygienic quality of the rural water supplies by periodical analytical check;
- (3) Increasing the frequency of the examination of urban water supplies;
- (4) The constitution of a mobile unit for field analytical investigations on water supply, sewage and industrial wastes disposal problems;
- (5) Formation of a section of Sanitary bacteriology and biology; and
- (6) Establishing water testing laboratories attached to each major water supply schemes in the State.

The department maintained regular check over the hygienic quality of the public drinking water supplies in the state through periodical analytical examination. At present this supervisory examination is done three times a year. But in order to exercise a more effective control it is necessary that the check should be made more often especially in the case of those water supplies which are taken from surface sources subject to pollution and are treated in various ways.

The Chief Water Analyst continued to serve as:—

- (a) The Secretary, Water and Sewage Purification Committee, Government of Madras.
- (b) Member of the Disinfectants Sub-Committee and the Water Sectional Committee of the Indian Standards Institution.
- (c) Member of the Water Supply Expert Committee of the Corporation of Madras.

(d) Member of the Committee constituted in G.O. Ms. No. 1335, Food and Agriculture, dated 7th April 1960 for regulating fishing operations in Satyamurthi Sagar, Poondi.

The scientific work in the department involves a high degree of specialisation in a number of branches of scientific discipline. To meet this the department has been constituted of four integrated sections—viz: the Section of Bacteriology, the Section of Chemistry, the Section of Water Biology, and the Section of Sanitary (Medical) Biology. The facilities of equipment and trained personnel available in these laboratories have therefore been used for rendering a wide range of analytical and advisory service to the Government and the public. These include analysis of water for use in Agriculture horticulture, various industrial processes, analysis of milk, bottled beverages, fruit juices, aerated waters, etc., for their bacteriological quality, etc.

Number of samples of water tested.—During the year a total number of 10,545 samples of water were analysed. Out of this, 5,354 samples were taken from the protected water supplies in the state, inclusive of Madras City Hospital Supplies and 2,328 samples were received for test in connection with the rural water supply schemes. Eight hundred and twenty-eight samples were tested in connection with the new water supply augmentation or investigation schemes, from the Government and quasi Government agencies as well as private bodies.

The number of samples of water examined chemically and bacteriologically in connection with the research experiments at the Government Experimental Filter Station at Kilpauk is 675 during this year.

Full mineral analysis was conducted on 103 samples of water for assessing their suitability for specific industrial and other non-domestic uses.

Water treatment chemicals, alum (2 samples), Bleaching Powder (26 samples) were also analysed.

Four specimens of bone, two samples of urine and five samples of vegetables, cereals, etc., were analysed for their fluorine content. Seventy-one bacteriological tests were made for the determination of Rideal Walker Co-efficient on samples of disinfectants.

Samples were regularly taken from the Government Milk Factory at Teynampet. One hundred and thirty samples of milk and 52 samples of rinse waters from sterilised cans and bottles were examined bacteriologically. Thirty-eight samples of aerated water, milk powder and other foodstuffs were also examined for their sanitary quality.

Four thousand and two hundred bottles were specifically prepared, sterilised and supplied for drawing samples of water for bacteriological examination at this department.

Eleven thousand red of solutions of chemicals were supplied to Pilot Plant Laboratory at Guntakkal, etc. During the year under report, the department supplied 51 culture tubes of the Standard B. Typhosus 786 Lister Strain, maintained by this department to other laboratories in India for use in the Rideal Walker test on disinfectants.

SECTION OF WATER BACTERIOLOGY.

Three thousand nine hundred and seventy-two samples of water milk and miscellaneous samples were examined bacteriologically. Of these, 3,054 samples were tested in connection with the quality check on the Municipal Panchayat and other protected water supplies in the State.

Mac Conkey's bile salt lactose broth was used for the presumptive coliform test on water samples. From the presumptive test positive broth tubes inocula were cultured on Mac Conkey's agar and also Eosin Methylene Blue agar. All presumptive positive tests for coliforms were confirmed. False presumptive positives were not met with in any instance. Nearly 5,000 coliform colonies isolated by plating on the above media were studied in detail and classified into faecal, non-faecal and intermediate and irregular types. Tests for the presence of faecal streptococci, *Clostridium welchii* spores sulphate reducing organisms, agglutinating and non-agglutinating vibrios and Salmonella Shigella group of organisms were also made.

As a result of long experience of the conditions of the South Indian Water Supplies, this laboratory lays a special significance to the test for E.Coli-I, whose presence in any water is the most sensitive indication of contamination of faecal origin. In the examination of the rural water sources and their supplies E.Coli-I test has to be given special importance.

The Bacteriological quality of the Protected Water Supplies.—Presumptive coliform tests were carried out on all the samples of water taken from the water supply systems of the municipality, panchayats, etc. Differential coliform tests were made only on such of the distribution samples which fell short of the approved standards of bacteriological quality and on the new or investigation samples.

Among the 67 municipal and panchayat water supplies in the State 19 obtain their supply from surface sources such as impounded reservoir, lake or river. The samples of water taken from these surface sources showed a fairly heavy bacterial load and were of poor hygienic quality. In contrast to this all the samples taken from the infiltration galleries and wells were fair to satisfactory in bacteriological quality showing that they are relatively free from undesirable contamination. Thirty-one Municipalities and eight Panchayats derive their supply from such infiltration galleries and wells.

The water supplies at 19 municipalities and panchayats are filtered and chlorinated. At 45 places chlorination only is done. Out of the samples of chlorinated water taken at the Headworks 96 per cent were satisfactory bacteriologically. The corresponding figure for last year was 93 per cent.

During this year under report also, instances of total stoppage of chlorination of the supply for want of chlorine cylinder or Bleaching powder or defect in the chlorinating plants were met with. The need for providing uninterrupted supply of Bleaching powder or other chlorinating agent (liquid chlorine) and ensuring that this vital step in water purification viz., chlorination is not discontinued at any place for want of chlorinating agent, is again emphasised.

Eighty-three and 78 per cent of the samples of the distributed water taken from the municipal and panchayat supplies respectively were of satisfactory bacteriological quality. The corresponding figures for the last year were 80 per cent and 77 per cent. This would point out again to the need for maintaining the distribution network and the service reservoir clean by frequent flushing of the mains, prompt attention to damages and leaks and periodical cleaning of the service reservoir.

Railway station water supplies.—Seventy-nine per cent of the samples drawn from the platform supplies at the Railway Stations and Junctions were of satisfactory bacterial quality.

SECTION OF WATER CHEMISTRY.

This section examined during the year under report 5,859 samples of water for their physical and chemical characteristics. Out of this 2,328 samples were tested in connection with the issue of potability certificate for the various Rural Water Supply Schemes. Forty-nine samples of sewage and trade wastes were also analysed.

A full mineral analysis was made on 103 samples, some of which have been submitted for assessing their suitability for varied uses such as for boiled feeding, agriculture, air conditioning, washing motor vehicles, dyeing, concreting, etc.

In Table VIII are given the Turbidity figures and the chemical quality of the protected water supplies in the State.

The samples taken from Saidapet, Virudhunagar, Arantangi, Arni, Dindigul, Gudiyattam showed as usual a rather high but tolerable amount of dissolved mineral matter in solution. The samples taken from Manapparai Panchayat show the greatest concentration of dissolved mineral matter, brackishness and hardness. The rest of the supplies are of satisfactory chemical quality.

WATER BIOLOGY SECTION.

This section dealt with the examination of all samples of water for their biological characteristics, identification of the Microscopic fauna and flora in water and larger aquatic plants and biological growths, determination of algal control measures and advice to the local bodies in the control programme 2,939 samples were examined.

WATER AND SEWAGE PURIFICATION COMMITTEE.

The Water and Sewage Purification Committee considers all problems relating to the subjects which are brought up by the Members or are referred to it by the concerned Governmental and local bodies. During the year under report the Committee discussed the question connected with such problems and resolved—

(a) to strongly recommend to Government that the frequency of analytical supervision of Urban Water Supplies must be increased;

(b) to recommend to Government that at least minimum essential facilities should be established at each major water works in the State for testing samples of water so that a day-to-day control may be exercised over the quality of the supply and the treatment methods scientifically regulated;

(c) that as the fish farming and fish removal on a commercial scale in Satyamurthi Sagar is likely to affect adversely the hygienic safety of the Madras waster supply, steps should be taken to ensure that large scale fish removal is carried out under adequate control and supervision.

The results of the experiments carried out by the Water Analysis Department at Kilpauk Water Purification Research Station were also reviewed by the Committee. These experiments confirmed the previous finding that in regard to the filtration of the Red Hills lake water by slow sand filters the treatment with chlorine to the "Break Point" does would eliminate the production of sulphuretted Hydrogen in the filters. The results also showed that chloramine was as effective as chlorine and probably would be more economical. Either method of treatment was recommended for adoption for the time that the Madras Corporation authorities retained the slow sand filters in Commission.

Field investigations.—The closed integration of laboratory analytical examination with on the spot field investigation on problems connected with new water-supply schemes improvements or correction of defects in existing ones sewage and industrial waste disposal project, etc., is an outstanding feature of the activities of this department. Field investigation Units are constituted from among the technical staff of the department as and when required according to the nature of the problem to be studied and these units are deputed often at a very short notice. The necessary collecting and testing equipments are carried with the unit and such facilities as may be available locally are utilised for setting up field laboratories. This very important aspect of the work of this department required the use of a well fitted trailer laboratory attached to a motor truck so that the laboratory may be taken right to the spot and the tests carried out under proper conditions.

During the year under report the following investigations were made:—

23rd May 1960	.. ..	Kumbakonam Municipal Water Supply—Augmentation of the Supply Investigation of new sources (By Sri S. Venkataraman).
11th July 1960	.. ..	Tiruvallur Water Supply Scheme Investigation—Field tests on Water Samples with particular reference to the problem of iron (By Sri G. Chinnikrishnan).
14th September 1960	.. ..	Manjanaickenpatti and Nallarasahallipatti villages, Karur—Rural Water Supply sources—Investigation of the variations of the chemical quality (By Sri K. Venkatakrishnan).
2nd October 1960	.. ..	Dharangadhara Chemical Works, Arumuganeri, Tinnevely district.—Field Investigation pertaining to the problem of corrosion due to water (By Sri S. Venkataraman).
3rd November 1960	.. ..	Messrs. Hindustan Photo Films Project Establishment of Raw Film Factory at Ootacamund—Detailed Investigation of the quality of water in Sandynallah and other hill streams (By Sri S. Venkataraman).
1st December 1960	.. ..	Villivakkam Water Supply—Investigation of iron content of the water (By Sri K. Sankaran).

8th January 1961	.. ..	Kundah Hydro Electric Project Scheme—III Stage Extensions—Field Investigations and tests on water quality (By Sri S. Venkataraman).
3rd March 1961	.. ..	Tambaram Water Supply Scheme Investigation of water quality of trial borings in Palar river-bed at Villiambakkam (By Sri Chinnikrishnan).
16th to 30th March 1961	.. ..	Prevalance of Strange Diarrhoea in certain taluks of North Arcot and South Arcot districts. Investigation of Water supplies in diarrhoea afflicted villages (By Sri G. Swaminathan).

RESEARCH.

Owing to the difficulties mentioned earlier in this Report—Paragraph I under General, even the normal work in the Laboratories was very much affected during the year under report, special research work could not be undertaken.

Department of Water Analysis,
King Institute, Guindy, Madras-32.
24th June 1962.

G. SWAMINATHAN,
Chief Water Analyst.

(1960-61).

TABLE I.

	Number of samples.
Chemical and physical examination of samples of water from protected water supplies.	2,300
Bacteriological examination of samples of water from protected water supplies.	2,508
Chemical and physical examination of samples of water under Rural Water Supply Schemes.	2,328
Chemical and physical examination of samples of water in connection with new water-supply investigations, Government, Quasi-Government and Private parties.	828
Bacteriological examination of samples of water received from Government and Quasi-Government agencies and private bodies.	336
Samples tested for field investigations	396
Samples tested for Ferrous Iron (Special test)	1,200
Bacteriological examination of samples of water from City Hospital Water Supplies.	546

1960-61).

TABLE II.

GOVERNMENT EXPERIMENTAL FILTER STATION, KILPAUK.

	Number of samples.
Chemical examination of samples of water	300
Bacteriological examination of samples of water	375
Tests for estimation of H. S. and turbidity	340
Determination of Chlorine dose	18
Examination of Biological growths	22
Microscopical examination of filter sand	3
Dissolved oxygen determinations	280
Residual chlorine estimations	175

(1960-61).

TABLE III.

NON-DOMESTIC PURPOSES.

	Number of samples.
1 Water samples for mineral analysis	43
2 Water samples for use in boilers	12
3 Water samples for agricultural purposes	2
4 Water samples for building construction	9
5 Water samples for general industrial uses	11
6 Water samples for air conditioning	2
7 Water samples for washing vehicles	5
8 Water samples for gardening	1
9 Water samples for dyeing	2
10 Water samples for Fertiliser making	5
11 Water samples for concreting	5
12 Water samples for corrosive properties	6
Total	103
13 Samples of sewage and industrial wastes	49

(1960-61).

TABLE IV.

ALGOLOGICAL STUDIES.

	Number of samples.
1 Microscopic examination of samples of water from Municipal and Panchayat water supplies.	1,787
2 Algicide dose determinations	12
3 Test for residual copper and other algicides	74
4 Field tests for dissolved gases	20
5 Field tests for oxidisable organic matter	51
6 Examination of higher aquatic vegetation	8
7 Examination of plankton catches	17
8 Examination of sludge Ooze and sediment samples	13
9 Microscopical examination of samples of water from Rural Water Supply Sources.	1,114

(1960-61).

TABLE V.

MISCELLANEOUS ANALYSIS.

	Number of samples.
1 Ammonium sulphate for assay	1
2 Scales for analysis	3
3 Estimation of oil in water	1
4 Limestone for analysis	1
5 Alum for analysis	2
6 Bleaching powder for analysis	26
7 Determination of pH of solutions and media	4
8 Analysis of Bone for fluorine content	3
9 Samples of water for fluorine estimation only	12
10 Samples of soil, vegetables, cereals for fluorine content	5
11 Sample of superphosphate Scrubber waste for fluorine	1
12 Sample of urine for fluoride content	2
13 Distilled water for analysis	1
14 Samples of mud and tank ooze for estimation of Arsenic	4
15 Samples of sludge from Bore hole latrines for bacteriological examination	25
16 Tests for sulphate reducing bacteria and vibrios	326
17 Tests for S. S. group of organisms	56
18 Tests for Cl. Welchii and faecal Stptococci	156
19 Number of samples of aerated water, milk powder and other foodstuffs examined for their sanitary quality.	38
20 Number of tests on disinfectants for Rideal Walker co-efficient	71
21 Number of milk samples tested bacteriologically	130
22 Number of rinse samples from Utensils for Bacteriological examination	52
Total	920

(1960-61).

TABLE VI.

SOLUTIONS ETC. SUPPLIED.

	ML.
1 Scott. Sanchis reagent	6000
2 Mixed Indicator solution for Alkalinity	1,500
3 Brom Thymol Blue Indicator	1,000
4 Standard Silver Nitrate solution	2,000
5 Pot. Chromate Indicator	500
6 Number of B. Typhosus 786 Lister Strain Standard cultures supplied to other laboratories in India for R. W. tests.	51

TABLE VII.
1960-61.

Name of place.	Total number of			Nature of Source.					Filtration.				Chlorination.				
	Place.	Source.	Impounded reser-voir.	River or Stream.	Tank.	Well.	Bed.	Bank.	Mechanical.		Infiltration gallery or well.	Automatic Chlorine.	Mechani- cal.	Bleaching Powder.			
									Slow sand filter.	Pressure.					Grav. ity.		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Municipalities	48	69	15	9	3	6	24	12	3	3	8	37	18	28	1	40	Nil
Panchayat Boards	19	25	3	10	1	4	4	3	2	Nil	3	8	12	4	3	15	3
Jails and Approved Schools	13	17	..	1	1	8	5	2	..	1	..	7	9	3	Nil	14	Nil
Railway Stations	25	26	1	3	Nil	17	2	3	Nil	1	3	5	17	14	..	12	Nil
Other Institutions	3	46	13	11	Nil	17	3	2	9	4	3	5	25	14	4	18	10
Swimming pools	1	1	1	Nil	Nil	Nil	Nil	Nil	Nil	1	..	..	..	1	..	..	..
Total	139	184	33	34	5	52	38	22	14	10	17	62	81	64	8	99	13

TABLE VIII (1960-61).
Chemical quality of the water supplies.

Name of the Municipality/ Panchayat Board.	Turbidity million. Parts per	p.p. 100,000		Hardness,		pH.	Parts per million.				Nitrogen p.p. 100,000.				Value Permanganate (100 cc. test) (p.p.)
		Dissolved solids.	Total.	Carbonate.	Chlorides.		Fluorine.	Iron and Manganese.	Ammonical.	Albuminoid.	Nitrile.	Nitrate.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		
1 Arani	3.0	56.0	26.8	26.8	9.0	7.9	0.7	0.0	0.001	0.004	Nil	0.050	0.020		
2 Arcot	1.0	47.0	12.0	12.0	10.0	7.7	0.6	Nil	0.001	0.003	Trace	0.05	0.025		
3 Arkonam	2.0	46.0	16.0	16.0	7.5	7.7	0.7	Nil	0.008	0.002	Trace	Nil	0.063		
4 Bodinayakanur	2.0	11.0	7.2	5.9	0.6	7.3	0.2	0.15	0.001	0.002	Nil	Nil	0.059		
5 Chidambaram	10.0	21.0	11.0	11.0	2.1	7.9	0.3	0.53	0.001	0.007	Nil	Nil	0.036		
6 Chingleput	1.0	17.0	10.0	10.0	2.4	7.7	0.1	0.01	0.001	0.003	Nil	Nil	0.016		
7 Coimbatore	7.0	8.0	3.4	3.4	1.1	7.4	0.1	0.25	0.001	0.002	Nil	Nil	0.059		
8 Coonoor	5.0	8.0	1.7	1.7	0.8	6.9	Nil	0.45	0.001	0.002	Nil	Nil	0.048		
9 Cuddalore	55.0	..	..	..	3.2	..	..	5.60	0.001	0.004	Trace	0.05	0.052		
10 Dindigul	2.0	53.0	31.1	31.1	5.0	7.5	1.2 to 1.6	0.05	0.001	0.002	Nil	0.375	0.034		
11 Erode	1.0	20.0	8.8	8.8	1.3	7.8	0.2	0.05	0.001	0.006	Trace	Nil	0.044		
12 Gobichettipalayam	1.0	20.0	11.9	11.9	1.3	7.7	0.3	0.05	0.001	0.003	Nil	0.025	0.049		
13 Gudiyatham	1.0	53.0	20.2	20.2	6.8	7.7	0.8	Nil	0.001	0.001	..	0.125	0.012		
14 Kancheepuram	5.0	20.0	7.6	7.6	3.1	7.3	0.3	0.05	0.001	0.002	Trace	0.075	0.016		
15 Karaikudi	1.0	41.0	14.0	8.0	10.0	6.9	0.1	Nil	0.001	0.004	Nil	0.25	0.031		
16 Karur	1.0	40.0	24.6	24.6	2.6	7.5	0.8	Nil	0.001	0.001	Nil	0.25	0.020		
	1.0	91.0	42.2	42.2	20.0	7.9	1.8	Nil	0.001	0.001	Nil	0.25	0.084		
17 Kodaikanal	5.0	5.0	1.8	0.8	1.1	6.5	Nil	0.30	0.001	0.004	Nil	0.025	0.052		
18 Kumbakonam	1.0	16.0	11.0	11.0	1.4	7.5	0.2	Nil	0.004	0.002	Nil	0.025	0.016		
19 Madras Corporation.	7.0	17.0	5.7	5.7	2.7	6.9	0.3	0.15	0.011	0.002	Nil	0.025	0.052		
20 Madras Saidapet	1.0	52.0	18.6	16.8	22.0	7.7	0.5	0.25	0.001	0.003	Trace	0.175	0.044		

TABLE VIII--cont.
Chemical quality of the water supplies.

Name of Municipality/ Panchayat Board.	Turbidity Parts per million.	p.p. 100,000.				pH.	Parts per million.				Nitrogen p.p. 100,000.				Permanganate value (Tidy's test) (p.p. lit.).
		Dissolved solids.		Hardness.			Fluorine.	Iron and Manga- nese.	Ammonical.	Albuminoid.	Nitrite.	Nitrate.			
		Total.	Carbonate.	Chlorides.	(7)								(8)	(9)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)		
21 Madras, Sembium ..	10.0	30.0	8.5	8.3	8.3	6.9	0.3	0.75	0.001	0.003	Nil	0.025	0.020		
22 Madurai ..	57.0	3.0	22.6	22.6	10.0	7.9	0.8	Nil	0.003	0.008	Trace	Nil	0.008		
23 Mayuram ..	15.0	19.0	13.6	13.6	1.9	7.3	0.3	1.70	0.001	0.003	Nil	Nil	0.039		
24 Melapalayam ..	1.0	12.0	5.9	5.9	1.5	7.5	0.2	0.10	0.001	0.004	Nil	0.025	0.032		
25 Mettupalayam ..	1.0	16.0	9.6	8.6	1.5	7.7	0.2	0.15	0.001	0.004	Nil	0.025	0.043		
26 Nagapattinam ..	1.0	33.0	14.2	14.2	4.1	7.5	0.3	0.05	0.001	0.005	Trace	0.025	0.043		
27 Nagercoil ..	5.0	9.0	3.6	3.6	0.9	7.9	0.2	Nil	0.001	0.004	Nil	0.025	0.024		
28 Ootacamund ..	3.0	4.0	1.1	1.1	0.4	6.7	0.1	0.80	0.001	0.008	Nil	Nil	0.141		
29 Palani ..	5.0	8.0	3.2	3.2	0.8	7.5	0.1	0.30	0.001	0.004	Nil	0.025	0.092		
30 Palayamcottai ..	1.0	11.0	5.5	5.5	1.5	7.5	0.4	0.05	0.001	0.002	Nil	0.025	0.036		
31 Periyakulam ..	1.0	8.0	4.6	4.0	0.8	7.3	0.3	0.10	0.001	0.004	Nil	0.05	0.084		
32 Pollachi ..	1.0	50.0	19.4	19.4	5.6	7.7	1.6	0.05	0.001	0.004	Trace	0.15	0.080		
33 Pudukottai ..	5.0	13.0	4.8	1.0	1.6	5.5	0.1	0.06	0.002	0.008	Trace	0.075	0.036		
34 Ranipet ..	3.0	50.0	14.6	14.6	11.8	7.7	0.7	Nil	0.002	0.002	Trace	Nil	0.028		
35 Salem ..	1.0	18.0	19.9	19.9	1.5	7.9	0.2	0.05	0.002	0.003	Nil	Nil	0.050		
	30.0	27.0	11.9	11.9	1.7	7.5	0.5	1.40	0.006	0.020	Trace	0.025	0.206		
36 Shencottah ..	1.0	40.0	24.2	24.2	3.1	7.6	0.4	0.05	0.001	0.001	Nil	0.125	0.004		
37 Srirangam ..	1.0	20.0	10.2	10.2	1.6	7.6	0.3	0.10	0.012	0.002	Nil	Nil	0.035		
38 Srivilliputtur ..	1.0	23.0	10.6	10.6	1.0	7.7	0.3	0.05	0.001	0.002	Nil	0.025	0.040		
39 Thanjavur ..	1.0	23.0	10.4	10.4	1.9	7.9	0.4	0.05	0.001	0.001	Nil	Nil	0.028		
40 Tirdivanam ..	1.0	36.0	15.8	15.8	5.3	7.5	0.6	0.10	0.001	0.001	Nil	0.050	0.024		
41 Tiruchirappalli ..	1.0	24.0	14.0	14.0	1.9	7.6	0.3	0.10	0.001	0.002	Nil	Nil	0.023		
42 Trivellore ..	15.0	15.0	4.4	4.4	1.7	7.0	0.5	1.11	0.001	0.003	Nil	0.050	0.032		
43 Tiruppur ..	2.0	44.0	22.6	22.6	4.2	7.9	0.8	Nil	0.001	0.001	Nil	0.250	0.016		
44 Tiruvannamalai ..	1.0	36.0	21.8	21.8	2.4	7.5	0.5	0.05	0.001	0.002	Nil	0.050	0.021		
45 Tuticorin ..	1.0	20.0	9.8	9.4	3.7	7.7	0.2	Nil	0.001	0.039	Nil	Nil	0.025		
46 Virudunagar ..	1.0	59.0	18.5	18.5	11.4	7.9	0.7	0.05	0.001	0.002	Nil	0.050	0.040		
47 Vellore ..	1.0	32.0	14.8	14.8	3.1	7.7	0.7	Nil	0.001	0.001	Nil	0.050	0.019		
48 Walajahpet ..	1.0	29.0	10.2	10.2	4.3	7.9	0.7	0.05	0.001	0.001	Nil	0.050	0.020		
Panchayats.															
1 Arantangi ..	1.0	75.0	18.6	18.6	27.0	7.5	0.3	0.05	0.002	0.002	Trace	0.025	***		
2 Belagundu ..	1.0	24.0	16.8	16.8	1.1	7.7	0.7	0.05	0.001	0.003	Nil	0.025	0.020		
3 Chennimalai ..	1.0	23.0	13.9	13.9	0.9	7.7	0.7	0.05	0.001	0.002	Trace	0.025	0.020		
4 Gudalur ..	3.0	8.0	3.0	3.0	0.5	7.5	..	0.20	0.001	0.002	Nil	Nil	0.067		
5 Kanyakumari ..	..	..	..	..	Nagercoil supply.										
6 Karungal ..	1.0	43.0	18.2	16.2	12.4	7.1	0.5	Nil	0.001	0.001	Nil	0.050	0.012		
7 Kayalpattinam ..	5.0	28.0	13.8	13.8	4.3	7.9	0.3	0.30	0.001	0.007	Trace	0.025	0.136		
8 Kotagiri ..	1.0	5.0	1.1	1.1	0.5	5.7	Nil	Nil	0.001	0.003	Nil	0.050	0.016		
9 Manapparai ..	1.0	152.0	52.8	36.4	53.0	7.9	1.6	Nil	0.001	0.001	Nil	0.150	0.008		
10 Mettur Dam ..	1.0	18.0	9.9	9.9	1.4	7.7	0.2	0.05	0.001	0.004	Trace	Nil	0.052		
11 Muttom ..	5.0	17.0	5.0	4.1	5.6	6.2	0.1	0.45	0.001	0.001	Trace	Nil	0.012		
12 Pannaikadu ..	1.0	7.0	1.2	1.2	0.4	7.1	0.1	0.10	0.001	0.002	Nil	Nil	0.076		
13 Rajakkamangalam ..	1.0	9.0	3.2	3.2	1.9	5.9	0.1	Nil	0.001	0.001	Nil	0.050	0.004		
14 Rameswaram ..	1.0	37.0	18.0	18.0	9.3	7.9	0.5	Nil	0.001	0.003	Nil	0.025	0.027		
15 Suchindram ..	..	..	..	Nagercoil Municipality Supply.											
16 Tiruchendur ..	..	..	..	Kayalpattinam Supply.											
17 Tiruttani ..	5.0	22.0	14.9	14.9	1.4	7.7	0.7	0.08	0.003	0.012	Nil	Nil	0.070		
18 Tiruvethipuram ..	1.0	28.0	12.1	12.1	4.3	8.1	0.5	0.10	0.001	0.001	Nil	0.050	0.024		
19 Valparai ..	1.0	8.0	2.3	2.3	0.9	5.9	0.1	0.40	0.001	0.002	Trace	0.075	0.008		



EDUCATION AND PUBLIC HEALTH DEPARTMENT
(Health)

G.O. No. 1857, 23rd July 1963.

Administration Report 1960-61—Government Analyst and Chief Water Analyst Sections—Reviewed.

READ—the following papers :—

1. G.O. Ms. No. 1287, Health, dated 24th May 1962.
2. Letter from the Director of Public Health, dated 16th February and 18th May 1962, No. 121959-3/UN. 3/61.
3. Letter from the Director of Public Health, dated 27th February, 30th May and 19th July 1962, No. 55446/16/VS/61.
4. Letter from the Director of Public Health, dated 9th July 1962, No. 142/UN. 1/62.

Order—No. 1857, Education and Public Health (Health), dated 23rd July 1963.

Recorded.

2. *Food and Drug Analysis Section.*—During the year under report, 18,485 and 438 samples of food and drugs respectively were analysed in the laboratory as against 11,726 and 359 samples in the previous year. The number of food and drug samples found adulterated or otherwise unsatisfactory was 3,667 and 160 respectively as against 5,840 and 66 in the previous year.

During the year, a total number of 170 Local Bodies (63 Municipalities and 107 Panchayats) sent food samples under the Prevention of Food Adulteration Act, as against 163 Local Bodies (62 Municipalities and 101 Panchayats) during the previous year. The difficulties reported to have been encountered by this Department immediately on transfer to the Public Health Department due to inadequate ministerial staff, have been overcome to a large extent, by the appointment of additional staff. There has been speedy progress in the clearance of arrears relating to the analysis of samples and in the collection of arrears of contribution due from the Local Bodies. The Government Analyst's Laboratory continued to analyse the food samples

received from the Local Bodies in Andhra Pradesh. Besides, samples of diet articles supplied by contractors to Government Hospitals in the State, drug samples taken under the Drugs Act, samples of suspected food articles taken in connection with the incidence of food poisoning cases, etc., were also analysed in the Government Analyst's Laboratory.

3. *Water Analysis Section.*—The Department continued to maintain a regular check over the hygienic quality of the public drinking water supplies in the State through periodical analytical examination. Water supplies in 67 Local Bodies (48 Municipalities and 19 Panchayats) and 72 supplies attached to jails, railway stations, etc., were continued to be examined during the year. The total number of samples of water analysed during the year by this Department was 10,545 against 9,193 during the previous year. The samples examined included 5,354 samples from protected water supplies and 2,328 samples received in connection with "Rural Water Supply Schemes". During the year, nine field investigations were carried out as against eleven in the previous year.

The Government regret to note that much of the poor bacteriological quality of water distributed is due to the following defects:—

(1) Total stoppage of chlorination or defective chlorination of the distribution network;

(2) Disrepair and improper cleaning of the distribution network.

The supply of pure and wholesome water to the public need hardly be emphasised. The Director of Public Health is therefore requested to draw the attention of the authorities concerned to the defects mentioned above with a view to remedying them.

(By order of the Governor.)

P. P. I. VAIDYANATHAN,
Secretary to Government.

To the Director of Public Health, Madras-6.

„ the Controller of Stationery and Printing, Madras-1 [for distribution of copies with reference to G.O. (Ms.) No. 1294, Health, dated 5th March 1962 as subsequently amended].
„ the Copy to H-3, Education and Public Health Department (with extracts).

