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DISEASES

MUNICIPALITY OF COLOMBO.

REPORT

XXVI

OF THE

MEDICAL OFFICER OF HEALTH,

FOR THE YEAR

1931.

Colombo:
PRINTED AT THE MUNICIPAL PRINTING OFFICE, CEYLON.

1932.

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CONTENTS,

STATISTICAL SUMMARY.

Mean temperature	... ...	81·8°
Mean humidity	... ...	81·0 per cent.
Rainfall	... ...	106·38 inches.
Average rainfall for the last 24 years	... ...	89·27 inches.
Area within Municipal Council's limits exclusive of lake		8,317 acres.
Population by Census of 1931	... ...	284,155
Estimated mean population for 1931	... ...	285,623
Average density per acre	... ...	34
Number of live births registered	... ...	8,783
Birth-rate (per 1,000 of estimated population)	...	30·8
Birth-rate (corrected for non-residents)	... ...	25·7
Maternal mortality rate (per 1,000 births)	...	24·8
Maternal mortality rate (corrected for non-residents)	...	18·5
Number of infant deaths	... ...	1,512
Infant mortality rate (per 1,000 births)	... ...	172
Infant mortality rate (corrected for non-residents)	...	177
Percentage of infant deaths to total mortality	...	21·1
Stillbirths	... ...	627
Rate per 1,000 births live and still	... ...	66·6
Number of deaths	... ...	7,154
Crude death-rate per 1,000 population	... ...	25·1
Corrected death-rate per 1,000 population	...	20·1
Pneumonia ...	No. of deaths	895
	Death-rate	3·13
Phthisis ...	No. of deaths	648
	Death-rate	2·22
Enteric Fever ...	No. of deaths	171
	Death-rate	0·60
Plague ...	No. of deaths	45
	Death-rate	0·16
Diarrhœa and Enteritis	No. of deaths	446
	Death-rate	1·56
Dysentery ...	No. of deaths	59
	Death-rate	0·21

REPORT OF THE MEDICAL OFFICER OF HEALTH FOR 1931.

I HAVE the honour to submit the Administration Report of the Public Health Department for the year 1931.

The Census enumeration of 1931 showed that the population of Colombo was higher than the estimated population by about 12,000.

The year 1931 was, on the whole, an average normal year except for rather an unusual amount of rainfall in the months of July and August, and, of course, the financial depression and consequent unemployment and distress.

The health of the city was, on the whole, satisfactory. The crude general death-rate was 25·1 per 1,000, as against 29·3 in 1930, and the corrected rate was 20·1, as against 23·7 in the previous year. This is the lowest general death-rate so far recorded.

The maternal mortality rate (crude) 24·8 and (corrected) 18·5 was also below the rates for the previous year, namely, 29·0 and 23·7 respectively.

The infant mortality rate had also the lowest rate so far recorded, namely, 172 (crude) and 177 (corrected) per 1,000 births.

Enteric fever also showed an improvement, the number of deaths being 171, as against 205 in the previous year, and the death-rate from this cause being 0·60, as against 0·73 in the previous year.

Plague showed a slight increase, there being 47 cases with 45 deaths, as against 40 cases in the three previous years. The increase was due to a sharp but short outbreak of a virulent type in Kotahena, with marked pulmorary signs and symptoms, the first cases of which were not recognized as plague and, therefore, not notified.

Dysentery and diarrhœa and enteritis also showed a marked improvement over the previous year, but phthisis showed a slight setback.

The sections on infant and maternal mortality and Child Welfare work have been treated this year as fully as the statistics permitted. This branch of our work is yielding excellent and rapid results, and to those who are pessimistic or doubtful of the value of Infant Welfare work, Diagram I. would, I am sure, be a pleasant surprise.

C. V. ASERAPPA, M.R.C.S., L.R.C.P., D.P.H., D.T.M. & H.,
Medical Officer of Health.

The Town Hall,
Colombo, April 8, 1932.

Part I.—Statistics.

I.—METEOROLOGY.

Temperature.—The mean temperature for 1931 was 81·8°, as against 80·5° in 1930. The maximum monthly mean temperature recorded during the year was 82·2° in March, April, and May, and the minimum temperature was 79·0° in December. The average mean temperature for the last 24 years was 80·2°.

Rainfall.—The total rainfall was 106·38 inches, as against 116·51 inches, in 1930. The maximum monthly rainfall was 15·74 inches in November, and the minimum 1·86 inches in March.

Humidity.—The mean humidity was 81 per cent., as against 80 per cent. in 1930 and ranged from a minimum of 75 per cent. in January to a maximum of 84 per cent. in May, June, August, and November.

II.—POPULATION.

The population of the Colombo Municipality as enumerated at the Census of February 26, 1931, was 284,155 exclusive of the Military and Shipping. This figure is considerably higher than the estimate based on the previous Census population.

The following table shows the distribution of population by race at the Census enumeration and the population estimated to the middle of the year.

(1) *Population, 1931.*

	Population enumerated at the Census of February 26, 1931.	Population Estimated to the middle of 1931.
All Races ...	284,155	285,623
Europeans ...	3,340	3,357
Burghers ...	15,887	15,969
Sinhalese ...	127,927	128,588
Tamils ...	65,704	66,043
Moors ...	44,240	44,469
Malays ...	7,022	7,058
Others ...	20,035	20,139

The following Table shows the area, estimated population to middle of 1931, and density per acre of each ward.

(2) *Density of Population.*

Ward.	Area in Acres.	Estimated Population to middle of 1931.	Density per Acre.
Fort ...	250	1,639	6
Pettah ...	148	7,711	52
San Sebastian ...	124	13,243	107
St. Paul's ...	157	23,959	153
Kotahena ...	1,716	26,477	30
Mutwal ...		25,706	
New Bazaar ...	289	26,222	91
Maradana North ...	1,773	27,375	39
Maradana South ...		16,829	
Dematagoda ...		25,409	
Slave Island ...	331	24,896	75
Kollupitiya ...	1,468	17,765	18
Cinnamon Gardens ...		8,796	
Bambalapitiya ...	2,061	10,377	19
Timbirigasyaya ...		10,659	
Wellawatta ...		17,473	
Total ...	8,317	285,623*	34

III.—Births.

The total number of births registered in the city was 8,783, representing a birth-rate of 30·8 per 1,000 population, as against the revised rate of 32·6 for the previous year. The average birth-rate for the decade 1921-1930 was the same as the rate for 1931.

Corrected for non-residents in the Maternity Hospital, the birth-rate for the year was 25·7 per 1,000 population.

Mutwal, Slave Island, New Bazaar, Timbirigasyaya, and St. Paul's were the wards with the highest birth-rates.

Racially, the Malays had the highest birth-rate, namely, 43·9 per 1,000; next came the Sinhalese and Burghers with birth-rates of 41·2 per 1,000 and 34·9 per 1,000, respectively.

Statements 3 and 4 show the racial and ward birth-rates for 1931, compared with those of the previous year.

Stillbirths.—There were 627 stillbirths during the year, as against 675 in 1930.

The rate per 1,000 births live and still was 66·6, as against 68·5 for the previous year.

(3) *Racial Birth-rates, 1931.*

Race.	Birth-rate per 1,000 Population previous Year.	Number of Births, 1931.	Birth-rate per 1,000 Population, 1931.
All Races ...	32·6	8,783	30·8
Europeans ...	27·2	80	23·8
Burghers ...	38·2	558	34·9
Sinhalese ...	42·5	5,297	41·2
Tamils ...	19·7	1,261	19·1
Moors ...	30·0	1,115	25·1
Malays ...	46·0	310	43·9
Others ...	9·7	162	8·0

* This figure includes the outdoor population which cannot be assigned to the wards.

(4) *Ward Birth-rates, 1931.*

Ward.	Birth-rate per 1,000 Population previous Year.	Number of Births, 1931.	Birth-rate per 1,000 Population, 1931.
Colombo Town ...	32·6	8,783	30·8
Fort ...	1·2	1	0·6
Pettah ...	3·3	26	3·4
San Sebastian ...	20·1	238	18·0
St. Paul's ...	22·0	506	21·2
Kotahena ...	21·7	523	19·8
Mutwal ...	25·0	610	23·7
New Bazaar ...	24·1	586	22·3
Maradana North ...	21·1	524	19·1
Maradana South ...	17·4	261	15·5
Dematagoda ...	19·1	420	16·5
Slave Islaud ...	26·1	568	22·8
Kollupitiya ...	18·0	290	16·3
Cinnamon Gardens ...	9·3	100	11·4
Bambalapitiya ...	16·6	160	15·4
Timbirigasyaya ...	21·3	232	21·8
Wellawatta ...	20·5	315	18·0
Hospitals ...	—	3,423	—

IV.—Deaths.

The total number of deaths was 7,154, and the crude death-rate was 25·1 per 1000 of population—the lowest crude death-rate ever recorded in the city. The corrected death-rates too were the lowest on record (*vide* statements 5 and 6). Nearly all the wards showed a decrease in the death-rate, as compared with the figures for the previous year.

Mutwal, which had the highest birth-rate—namely, 23·7 per 1,000, had also the highest corrected death-rate, namely, 27·0.

The racial death-rate too showed an all-round improvement.

(5) *Racial Death-rates, 1931.*

Race.	Crude Death-rate per 1,000 Population previous Year	Number of Deaths, 1931.	Crude Death-rate, 1931.	Death-rate corrected for Deaths of Non-residents in Colombo Hospitals, 1931.	Decrease due to correction for Deaths of Non-residents in Colombo Hospitals.	Death-rate corrected for Deaths of Colombo Residents in Hospitals outside Colombo.
All Races	28·2	7,154	25·1	19·2	5·9	20·1
Europeans	15·2	45	12·7	10·1	2·6	—
Burghers	22·4	287	18·0	16·5	1·5	—
Sinhalese	35·1	4,152	32·3	20·7	11·6	—
Tamils	23·0	1,205	18·2	16·6	1·6	—
Moors	25·6	1,042	23·5	23·1	0·4	—
Malays	34·4	206	29·2	28·9	0·3	—
Others	12·4	217	10·8	9·8	1·0	—

(6) *Colombo Town Ward Death-rates for the Year, 1931.*

Ward.	Number of Deaths, 1931.	Crude Death-rate, 1931.	Death-rate corrected for Deaths in Colombo Hospitals, 1931.	Death-rate corrected for Deaths in Colombo Hospitals previous Year.	Increase or Decrease of the 1931 corrected Death-rate as compared with previous Year's.
Colombo Town ...	7,154	25·1	19·2	22·0	—2·8
Fort ...	20	12·2	13·4	10·5	+2·9
Pettah ...	41	5·4	18·7	20·4	—1·7
San Sebastian ...	215	16·2	18·0	18·2	—0·2
St. Paul's ...	387	16·2	18·4	23·3	—4·9
Kotahena ...	354	13·4	17·2	19·1	—1·9
Mutwal ...	578	22·5	27·0	27·3	—0·3
New Bazaar ...	465	17·7	22·4	25·4	—3·0
Maradana North ...	379	13·8	18·7	23·3	—4·6
Maradana South ..	231	13·7	19·6	21·6	—2·0
Dematagoda ...	312	12·3	18·1	22·3	—4·2
Slave Island ...	437	17·6	21·9	24·6	—2·7
Kollupitiya ...	167	9·5	12·7	12·6	+0·1
Cinnamon Gardens ...	58	6·6	7·7	7·8	—0·1
Bambalapitiya ...	100	9·6	13·0	14·2	—1·2
Timbirigasyaya ...	104	9·8	15·4	16·4	—1·0
Wellawatta ...	167	9·6	13·6	13·8	—0·2
Hospitals ...	3,139	—	—	—	—

(7) *Births and Deaths and the Infant Mortality for each Ward of the City of Colombo during the Year 1931.*

WARD.	BIRTHS.										DEATHS.										No. of Infant Deaths.
	Total Births.			Nationality.							Total Deaths.			Nationality.							
	Persons.	Males.	Females.	Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.	Persons.	Males.	Females.	Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.	
Colombo City ...	8,783	4,527	4,256	80	558	5,297	1,261	1,115	310	162	7,154	3,894	3,260	45	287	4,152	1,205	1,042	206	217	1,512
Fort	1	1	—	—	—	1	—	—	—	—	20	20	—	4	2	4	3	4	—	3	—
Pettah	26	13	13	—	—	6	10	—	3	7	41	33	8	—	1	6	11	14	—	9	6
San Sebastion	238	126	112	—	2	57	38	120	10	11	215	112	103	—	2	42	35	123	7	6	62
St. Paul's	506	277	229	—	6	100	233	142	3	22	387	201	186	—	2	58	176	125	3	23	109
Kotahena	523	260	263	—	53	276	136	41	8	9	354	197	157	1	23	180	99	45	4	2	103
Mutwal	610	317	293	—	24	418	91	50	12	15	578	278	300	—	18	411	81	42	10	16	125
New Bazaar	586	316	270	—	48	215	56	226	15	26	465	224	241	—	26	146	54	214	5	20	135
Maradana North ...	524	264	260	—	33	228	72	145	34	12	379	196	183	—	16	181	52	106	11	13	116
Maradana South ...	261	126	135	—	14	135	34	53	22	3	231	121	110	1	10	127	32	42	15	4	57
Dematagoda	420	227	193	—	28	222	44	84	39	3	312	159	153	1	25	175	32	57	17	5	104
Slave Island	568	285	283	1	33	196	75	118	116	29	437	225	212	—	11	141	70	95	99	21	104
Kollupitiya	290	142	148	8	28	161	53	23	14	3	167	85	82	2	12	88	41	17	7	—	44
Cinnamon Gardens ...	100	52	48	4	9	47	23	10	5	2	58	33	25	2	1	33	14	4	2	2	9
Bambalapitiya ...	160	84	76	1	18	93	38	6	—	4	100	42	58	1	17	60	16	6	—	—	26
Timbirigasyaya ...	232	109	123	48	6	139	31	4	2	2	104	58	46	10	3	71	9	10	—	1	31
Wellawatta	315	153	162	—	52	161	56	36	7	3	167	77	90	1	23	90	22	26	3	2	36
Hospital (Town residents)											1,426	849	577	11	71	825	334	95	20	70	
Hospital (Untraced)	3,423	1,775	1,648	18	204	2,842	271	57	20	11	48	33	15	—	1	26	17	2	1	1	445
Hospital (Non-residents)											1,665	951	714	11	23	1,488	107	15	2	19	

V.—Principal Causes of Deaths.

Pneumonia caused 895 deaths or 12·5 per cent. of the total number of deaths registered in the city. Tuberculous diseases caused 9·8 per cent. of the total number of deaths.

Next came the diarrhœal diseases with 631 deaths or 8·8 per cent. of the total number of deaths.

(8) *Statement of Principal Causes of Deaths, 1931.*

Cause of Death.	No. of Deaths.	
*Pneumonia and Broncho-Pneumonia ...	895	
Diarrhœa and Enteritis ...	531	631 Total Diarrhœal.
*Dysentery	100	
*Pulmonary Tuberculosis	648	703 Total Tuberculous Diseases.
Tuberculosis of the Meninges and Central Nervous System	8	
Tuberculosis of the Intestines and Peritoneum	27	
Tuberculosis of the Vertebral Column ...	3	
Tuberculosis of the Lymphatic System ...	2	
Tuberculosis of other Organs... ...	13	
Disseminated Tuberculosis	2	
Congenital Debility (under one year) ...	461	
Influenza	494	
Infantile Convulsions (under five years) ...	101	
*Enteric Fever	171	
Malaria	103	
Pyrexia	48	
*Plague (including deaths at the Infectious Diseases Hospital)	45	

(9) *Certain Minor Causes of Deaths, 1931.*

Cause of Death.	No. of Deaths	Cause of Death.		No. of Deaths.
Intestinal Parasites other than Hookworm	217	Tetanus	under 1 year 12 / 1 year and over 59	71
Hookworm	170	Rabies		6
Cancer	122	*Diphtheria		6
Paralysis (cause unspecified) ...	105	*Whooping Cough... ...		3
Rickets	78	Lethargic Encephalitis ...		4

(10) *Causes of Deaths registered in Colombo Town during the Year 1931.*

Causes of Death.	All Races.	Nationality. Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
All Causes ...	7,154	45	287	4,152	1,205	1,042	206	217
I.—Epidemic, Endemic, and Infectious Diseases:—								
1. Epidemic and Endemic Diseases ...	926	7	29	467	159	182	32	50
2. Infectious Diseases—								
a. Tuberculous Diseases ..	703	4	27	426	123	90	17	16
b. Venereal Diseases ...	51	—	1	33	16	—	1	—
c. Other Infectious Diseases ...	119	1	4	56	32	18	2	6
II.—General Diseases not in Class I.—								
1. Cancer and Malignant Diseases ...	124	3	7	86	15	8	—	5
2. Other General Diseases not in Class I.	221	2	15	119	28	43	10	4
III.—Diseases of the Nervous System and Organs of Special Sense ...	425	3	25	232	70	72	11	12
IV.—Diseases of the Circulatory System ...	338	7	26	190	43	56	10	6
V.—Diseases of the Respiratory System ...	1,228	5	50	725	213	155	30	50
VI.—Diseases of the Digestive System ...	1,099	2	37	711	168	124	35	22
VII.—Non-venereal Diseases of the Genito-Urinary System and Annexa ...	360	3	13	175	69	71	21	8
VIII.—The Puerperal State	217	—	4	148	33	22	8	2
IX.—Diseases of the Skin and of the Cellular Tissue	71	1	6	43	14	3	2	2
X.—Diseases of the Bones and of the Organs of Locomotion	7	—	—	4	3	—	—	—
XI.—Malformations	9	—	—	8	1	—	—	—
XII.—Early Infancy	715	—	18	432	121	166	17	21
XIII.—Old Age	265	1	15	130	40	70	8	1
XIV.—External Causes—								
1. Suicide	17	1	1	9	6	—	—	—
2. Homicide	25	—	—	17	5	1	—	2
3. Judicial Hanging or Execution ...	16	—	—	12	2	—	—	2
4. Accident and other External Violence	140	3	5	87	30	7	1	7
XV.—Ill-defined Diseases	78	2	4	42	14	14	1	1

* Notifiable Infectious Diseases.

(10) *Causes of Deaths, &c.*—contd.

Causes of Death.	All Races.	Nationality.					
		Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
I.—Epidemic, Endemic, and Infectious Diseases.								
1.—Enteric Fever—								
a. Typhoid Fever	171	3	8	132	13	2	3	10
b. Paratyphoid Fever	—	—	—	—	—	—	—	—
2.—Typhus Fever	—	—	—	—	—	—	—	—
3.—Relapsing Fever (spirillum obermeieri)	—	—	—	—	—	—	—	—
4.—Malta Fever	—	—	—	—	—	—	—	—
5.—Malaria—								
a. Malarial Fever	97	2	2	52	23	7	2	9
b. Malarial Cachexia	6	—	—	3	2	1	—	—
c. Blackwater Fever	—	—	—	—	—	—	—	—
6.—Smallpox—								
a. Vaccinated	—	—	—	—	—	—	—	—
b. Unvaccinated	—	—	—	—	—	—	—	—
c. Vaccination doubtful	—	—	—	—	—	—	—	—
7.—Measles	—	—	—	—	—	—	—	—
8.—Scarlet Fever	—	—	—	—	—	—	—	—
9.—Whooping Cough	3	—	—	—	1	2	—	—
10.—Diphtheria	6	—	—	6	—	—	—	—
11.—Influenza—								
a. With pulmonary complications specified	57	—	2	19	14	12	4	6
b. Without pulmonary complications specified	438	1	11	181	74	132	22	17
12.—Miliary Fever	1	—	—	1	—	—	—	—
13.—Mumps	—	—	—	—	—	—	—	—
14.—Asiatic Cholera	1	—	—	1	—	—	—	—
15.—Cholera Nostras	—	—	—	—	—	—	—	—
16.—Dysentery—								
a. Amœbic	13	—	1	6	3	2	—	1
b. Bacillary	32	—	2	21	4	2	—	3
c. Other or unspecified	55	—	—	35	11	6	—	3
17.—Plague—								
a. Bubonic	18	—	1	1	5	10	—	1
b. Pneumonic	—	—	—	—	—	—	—	—
c. Septicæmic	13	—	—	2	8	3	—	—
d. Unspecified	—	—	—	—	—	—	—	—
18.—Yellow Fever	—	—	—	—	—	—	—	—
19.—Spirochetal Hæmorrhagic Jaundice	—	—	—	—	—	—	—	—
20.—Leprosy	2	—	—	—	—	2	—	—
21.—Erysipelas	3	—	—	2	1	—	—	—
22.—Acute Anterior Poliomyelitis	6	1	1	2	—	1	1	—
23.—Lethargic Encephalitis	4	—	1	3	—	—	—	—
24.—Meningococcus Meningitis	—	—	—	—	—	—	—	—
25.—Other Epidemic and Endemic Diseases—								
a. Chickenpox	—	—	—	—	—	—	—	—
b. German Measles	—	—	—	—	—	—	—	—
c. Kala-azar	—	—	—	—	—	—	—	—
d. Others under this title	—	—	—	—	—	—	—	—
26.—Glanders	—	—	—	—	—	—	—	—
27.—Anthrax	—	—	—	—	—	—	—	—
28.—Rabies (Hydrophobia)	6	—	—	5	1	—	—	—
29.—Tetanus—								
(1) Under one year	12	—	1	7	1	3	—	—
(2) One year and over	59	—	1	33	17	5	1	2
30.—Mycoses—								
a. Thrush	11	—	1	—	2	6	1	1
b. Other Mycoses	2	—	—	1	1	—	—	—
31.—Tuberculosis of the Respiratory System—								
a. Laryngeal Tuberculosis	—	—	—	—	—	—	—	—
b. Pulmonary Tuberculosis	648	2	23	395	115	83	17	13
32.—Tuberculosis of the Meninges and Central Nervous System	8	—	1	5	1	—	—	1
33.—Tuberculosis of the Intestines and Peritoneum.	27	1	3	16	3	3	—	1
34.—Tuberculosis of the Vertebral Column	3	—	—	2	1	—	—	—
35.—Tuberculosis of the Joints	—	—	—	—	—	—	—	—
36.—Tuberculosis of other Organs—								
a. Tuberculosis of the Skin and Subcutaneous Cellular Tissue	—	—	—	—	—	—	—	—
b. Tuberculosis of the Bones (Vertebral Column excepted)	—	—	—	—	—	—	—	—
c. Tuberculosis of the Lymphatic System (Mesenteric and Retroperitoneal Glands excepted)	2	—	—	2	—	—	—	—
d. Tuberculosis of the Genito-Urinary System	—	—	—	—	—	—	—	—
e. Tuberculosis of Organs other than the above	13	—	—	6	3	3	—	1
37.—Disseminated Tuberculosis—								
a. Acute	2	1	—	—	—	1	—	—
b. Chronic or unspecified	—	—	—	—	—	—	—	—
38.—Syphilis	48	—	1	32	14	—	1	—
38*a*.—Parangi (Framboesia Tropicum, Yaws)	1	—	—	1	—	—	—	—
39.—Soft Chancre	—	—	—	—	—	—	—	—
40.—Gonococcus Infection	2	—	—	—	2	—	—	—
41.—Purulent Infection, Septicæmia	29	1	1	10	10	4	—	3

(10) *Causes of Deaths, &c.*—contd.

Causes of Death.	All Races.	Nationality.					
		Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
42.—Other Infectious Diseases—								
a. Vaccinia	—	—	—	—	—	—	—	—
b. Other diseases under this title ...	—	—	—	—	—	—	—	—
II.—General Diseases not included in Class I.								
43.—Cancer and other Malignant Tumours of the Buccal Cavity	28	—	1	18	7	1	—	1
44.—Cancer and other Malignant Tumours of the Stomach, Liver	16	—	1	12	—	2	—	1
45.—Cancer and other Malignant Tumours of the Peritoneum, Intestines, Rectum ...	3	—	—	3	—	—	—	—
46.—Cancer and other Malignant Tumours of the Female Genital Organs ...	17	1	1	11	2	2	—	—
47.—Cancer and other Malignant Tumours of the Breast	7	—	—	7	—	—	—	—
48.—Cancer and other Malignant Tumours of the Skin	—	—	—	—	—	—	—	—
49.—Cancer and other Malignant Tumours of other or unspecified Organs ...	51	2	4	33	6	3	—	3
50.—Tumours not returned as Malignant (Brain and Female Genital Organs excepted) ...	2	—	—	2	—	—	—	—
51.—Acute Rheumatic Fever ...	—	—	—	—	—	—	—	—
52.—Chronic Rheumatism, Osteoarthritis, Gout ...	19	1	2	8	4	4	—	—
53.—Scurvy	1	—	—	1	—	—	—	—
54.—Pellagra	—	—	—	—	—	—	—	—
55.—Beri-Beri	—	—	—	—	—	—	—	—
56.—Rickets	78	—	3	45	9	14	6	—
57.—Diabetes Mellitus	94	—	7	54	6	19	4	4
58.—Anæmia, Chlorosis—								
a. Pernicious Anæmia ...	11	—	—	5	2	4	—	—
b. Other Anæmias and Chlorosis ...	9	1	1	2	3	2	—	—
59.—Diseases of the Pituitary Gland ...	—	—	—	—	—	—	—	—
60.—Diseases of the Thyroid Gland—								
a. Exopthalmic Goitre ...	—	—	—	—	—	—	—	—
b. Other Diseases of the Thyroid Gland	1	—	—	1	—	—	—	—
61.—Diseases of the Parathyroid Glands ...	—	—	—	—	—	—	—	—
62.—Diseases of the Thymus Gland ...	1	—	—	—	1	—	—	—
63.—Diseases of the Adrenals (Addison's Disease) .	—	—	—	—	—	—	—	—
64.—Diseases of the Spleen	1	—	—	—	1	—	—	—
65.—Leukæmia and Hodgkin's Disease—								
a. Leukæmia	2	—	—	1	1	—	—	—
b. Hodgkin's Disease	—	—	—	—	—	—	—	—
66.—Alcoholism (acute or chronic) ...	1	—	—	1	—	—	—	—
67.—Chronic Poisoning by mineral substances—								
a. Chronic Lead Poisoning ...	—	—	—	—	—	—	—	—
b. Others under this title ...	—	—	—	—	—	—	—	—
68.—Chronic Poisoning by organic substances ...	—	—	—	—	—	—	—	—
69.—Other General Diseases	3	—	2	—	1	—	—	—
III.—Diseases of the Nervous System and of the Organs of Special Sense.								
70.—Encephalitis	2	—	—	1	—	1	—	—
71.—Meningitis—								
a. Simple Meningitis	18	—	—	12	5	1	—	—
b. Non-epidemic Cerebro-Spinal Meningitis	2	—	—	2	—	—	—	—
72.—Tabes Dorsalis (Locomotor Ataxia) ...	—	—	—	—	—	—	—	—
73.—Other Diseases of the Spinal Cord ...	4	—	1	2	1	—	—	—
74.—Cerebral Hæmorrhage, Apoplexy—								
a. Cerebral Hæmorrhage ...	113	3	13	45	18	26	3	5
b. Cerebral Embolism and Thrombosis. .	34	—	1	18	7	6	—	2
75.—Paralysis without specified cause—								
a. Hemiphlegia	71	—	3	35	12	17	3	1
b. Other forms of Paralysis ...	34	—	1	27	2	2	1	1
76.—General Paralysis of the Insane ...	—	—	—	—	—	—	—	—
77.—Other forms of Insanity	6	—	—	4	1	1	—	—
78.—Epilepsy	13	—	2	7	1	3	—	—
79.—Convulsions (non-puerperal ; 5 years and over)	5	—	—	3	2	—	—	—
80.—Infantile Convulsions (under 5 years of age) .	111	—	2	69	19	14	4	3
81.—Chorea	—	—	—	—	—	—	—	—
82.—Neuralgia and Neuritis	—	—	—	—	—	—	—	—
83.—Softening of the Brain	—	—	—	—	—	—	—	—
84.—Other Diseases of the Nervous System ...	2	—	—	2	—	—	—	—
85.—Diseases of the Eye and Annexa ...	1	—	—	1	—	—	—	—
86.—Diseases of the Ear and of the Mastoid Process—								
a. Diseases of the Ear ...	6	—	—	3	2	1	—	—
b. Diseases of the Mastoid Process ...	3	—	2	1	—	—	—	—
IV.—Diseases of the Circulatory System.								
87.—Pericarditis	3	—	—	2	1	—	—	—
88.—Acute Endocarditis and Myocarditis ...	81	1	6	42	12	15	3	2
89.—Angina Pectoris	16	—	1	7	3	5	—	—

(10) *Causes of Deaths, &c.*—contd.

Causes of Death.	All Races.	Nationality. Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
90.—Other Diseases of the Heart—								
a. Valvular Disease	20	—	1	6	2	10	1	—
b. Fatty Degeneration of Heart ...	34	1	1	17	3	10	1	1
c. Others under this title ...	120	3	10	74	16	11	4	2
91.—Diseases of the Arteries—								
a. Aneurysm	6	—	1	4	—	1	—	—
b. Arteriosclerosis	29	1	2	19	3	3	—	1
c. Other Diseases of the Arteries ...	2	—	—	1	1	—	—	—
92.—Embolism and Thrombosis (not Cerebral)...	5	—	—	5	—	—	—	—
93.—Diseases of the Veins (Varices, Hæmorrhoids, Phlebitis, &c.)	9	—	3	6	—	—	—	—
94.—Diseases of the Lymphatic System (Lymphangitis, &c.)	2	1	—	1	—	—	—	—
95.—Hæmorrhage without stated cause ...	11	—	1	6	2	1	1	—
96.—Other Diseases of the Circulatory System ...	—	—	—	—	—	—	—	—
V.—Diseases of the Respiratory System.								
97.—Diseases of the Nasal Fossæ and their Annexa—								
a. Diseases of the Nose ...	—	—	—	—	—	—	—	—
b. Others under this title ...	—	—	—	—	—	—	—	—
98.—Diseases of the Larynx	2	—	—	1	—	1	—	—
99.—Bronchitis—								
a. Acute	59	—	2	19	10	15	10	3
b. Chronic	102	—	7	59	12	19	2	3
c. Unspecified (under 5 years of age) ...	73	1	1	40	10	17	3	1
d. Unspecified (5 years and over) ...	22	1	—	8	4	8	—	1
100.—Broncho-Pneumonia	510	1	23	331	80	49	10	16
101.—Pneumonia	—	—	—	—	—	—	—	—
a Lobar	275	—	12	158	60	21	3	21
b. Unspecified	110	—	3	66	19	17	1	4
102.—Pleurisy—								
a. Empyema	11	—	—	9	1	—	—	1
b. Other forms of Pleurisy ...	19	—	—	10	5	3	1	—
103.—Congestion and Hemorrhagic Infarct of the Lung	9	2	—	4	3	—	—	—
104.—Gangrene of the Lung	4	—	—	1	3	—	—	—
105.—Asthma	29	—	2	17	5	3	—	—
106.—Pulmonary Emphysema	—	—	—	—	—	—	—	—
107.—Other Diseases of the Respiratory System—								
a. Chronic Interstitial Pneumonia, including Occupational Diseases of the Lungs	—	—	—	—	—	—	—	—
b. Diseases of the Mediastinum ...	—	—	—	—	—	—	—	—
c. Others under this title ...	3	—	—	2	1	—	—	—
VI.—Diseases of the Digestive System.								
108.—Diseases of the Buccal Cavity and Annexa..	6	—	—	4	2	—	—	—
109.—Diseases of the Pharynx and Tonsils—								
a. Tonsilitis, Adenoid Vegetations ...	—	—	—	—	—	—	—	—
b. Other Diseases under this title ...	—	—	—	—	—	—	—	—
110.—Diseases of the Œsophagus ...	2	—	—	1	1	—	—	—
111.—Ulcer of the Stomach or Duodenum—								
a. Ulcer of the Stomach ...	4	—	1	1	1	1	—	—
b. Ulcer of the Duodenum ...	1	—	—	—	—	1	—	—
112.—Other Diseases of the Stomach ...	7	—	—	3	2	2	—	—
113.—Diarrhœa and Enteritis (under 2 years of age)	190	1	10	118	23	25	10	3
114.—Diarrhœa and Enteritis (2 years and over)..	341	1	13	218	62	36	4	7
115.—Anchylostomiasis	170	—	2	128	24	8	4	4
116.—Diseases due to other Intestinal Parasites—								
a. Cestodes (Hydatids of the Liver excepted)	—	—	—	—	—	—	—	—
b. Trematodes	—	—	—	—	—	—	—	—
c. Nematodes (other than Anchylostoma)	17	—	—	14	3	—	—	—
d. Coccidia	—	—	—	—	—	—	—	—
e. Other parasites specified ...	1	—	—	—	1	—	—	—
f. Parasites not specified ...	199	—	4	125	20	34	11	5
117.—Appendicitis and Typhlitis ...	23	—	—	14	5	2	1	1
118.—Hernia, Intestinal Obstruction—								
a. Hernia	14	—	1	6	1	3	3	—
b. Intestinal Obstruction ...	26	—	—	14	5	5	1	1
119.—Other Diseases of the Intestines—								
a. Psilosis (Sprue or Ceylon Sore-mouth)	1	—	—	1	—	—	—	—
b. Others under this title ...	3	—	—	2	1	—	—	—
120.—Acute Yellow Atrophy of the Liver ...	3	—	—	3	—	—	—	—
121.—Hydatid Tumour of the Liver ...	—	—	—	—	—	—	—	—
122.—Cirrhosis of the Liver—								
a. Specified as alcoholic ...	6	—	—	6	—	—	—	—
b. Not specified as alcoholic ...	41	—	—	28	8	5	—	—
123.—Biliary Calculi	—	—	—	—	—	—	—	—
124.—Other Diseases of the Liver ...	—	—	—	—	—	—	—	—
a. Abscess of Liver (Amœbiasis) ...	8	—	1	4	3	—	—	—
b. Others under this title ...	11	—	4	6	—	—	—	1

(10) *Causes of Deaths, &c.*—contd.

Causes of Death.	All Races.	Nationality. Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
125.—Diseases of the Pancreas	1	—	—	1	—	—	—	—
126.—Peritonitis without specified cause	24	—	1	14	6	2	1	—
127.—Other Diseases of the Digestive System	—	—	—	—	—	—	—	—
VII.—Non-venereal Diseases of the Genito-Urinary System and Annexa.								
128.—Acute Nephritis (including unspecified under 10 years of age)	45	—	1	19	4	18	2	1
129.—Chronic Nephritis (including unspecified 10 years and over)	251	3	10	118	51	48	16	5
130.—Chyluria	—	—	—	—	—	—	—	—
131.—Other Diseases of the Kidneys and Annexa	24	—	—	12	8	3	—	1
132.—Calculi of the Urinary Passages	2	—	—	1	1	—	—	—
133.—Diseases of the Bladder	12	—	—	8	2	—	1	1
134.—Diseases of the Urethra, Urinary Abscess, &c.—								
a. Stricture of the Urethra	—	—	—	—	—	—	—	—
b. Others under this title	—	—	—	—	—	—	—	—
135.—Diseases of the Prostate	6	—	—	5	1	—	—	—
136.—Non-venereal Diseases of the Male Genital Organs	4	—	—	2	1	1	—	—
137.—Cysts and other Tumours of the Ovary not returned as malignant	4	—	1	2	1	—	—	—
138.—Salpingitis and Pelvic Abscess (Female)	4	—	1	3	—	—	—	—
139.—Tumours of the Uterus not returned as malignant	2	—	—	1	—	1	—	—
140.—Non-puerperal Uterine Hæmorrhage	—	—	—	—	—	—	—	—
141.—Other Diseases of the Female Genital Organs	6	—	—	4	—	—	2	—
142.—Non-puerperal Diseases of the Breast	—	—	—	—	—	—	—	—
VIII.—The Puerperal State.								
143.—Accidents of Pregnancy—								
a. Abortion	3	—	1	1	—	—	1	—
b. Ectopic Gestation	4	—	—	4	—	—	—	—
c. Other accidents of pregnancy	8	—	1	6	1	—	—	—
144.—Puerperal Hæmorrhage	20	—	—	18	—	1	1	—
145.—Other accidents of childbirth	3	—	—	3	—	—	—	—
146.—Puerperal Septicæmia	96	—	—	64	16	10	4	2
147.—Puerperal Phlegmasia, Alba Dolens, Embolism, Sudden Death	1	—	—	—	—	1	—	—
148.—Puerperal Albuminuria and Convulsions—								
a. Puerperal Convulsions	30	—	1	16	5	7	1	—
b. Puerperal Albuminuria	6	—	—	4	2	—	—	—
149.—Childbirth not assignable to other headings (Puerperal Insanity)	46	—	1	32	9	3	1	—
150.—Puerperal Diseases of the Breast	—	—	—	—	—	—	—	—
IX.—Diseases of the Skin and of the Cellular Tissue.								
151.—Gangrene	16	1	2	11	2	—	—	—
152.—Carbuncle, Boil	—	—	—	—	—	—	—	—
153.—Acute Abscess—								
a. Cellulitis	19	—	4	10	3	1	1	—
b. Acute abscess	13	—	—	9	2	1	—	1
154.—Other Diseases of the Skin and Annexa—								
a. Ulcer, Bedsore	17	—	—	8	6	1	1	1
b. Elephantiasis Arabum	—	—	—	—	—	—	—	—
c. Other Diseases under this title	6	—	—	5	1	—	—	—
X.—Diseases of the Bones and of the Organs of Locomotion.								
155.—Diseases of the Bones (Tuberculosis and Mastoid Diseases excepted)	7	—	—	4	3	—	—	—
156.—Diseases of the Joints (Tuberculosis and Rheumatism excepted)	—	—	—	—	—	—	—	—
157.—Amputations	—	—	—	—	—	—	—	—
158.—Other Diseases of the Organs of Locomotion	—	—	—	—	—	—	—	—
XI.—Malformations.								
159.—Congenital Malformations (Stillbirths excluded)—	1	—	—	1	—	—	—	—
a. Congenital Hydrocephalus	—	—	—	—	—	—	—	—
b. Congenital Malformations of the Heart	1	—	—	1	—	—	—	—
c. Others under this title	7	—	—	6	1	—	—	—
XII.—Early Infancy.								
160.—Congenital Debility, Icterus, and Sclerema	461	—	11	239	92	93	11	13
161.—Premature Birth : Injury at Birth—								
a. Premature Birth	219	—	7	189	29	10	6	8
b. Injury at Birth	1	—	—	1	—	—	—	—

(10) *Causes of Deaths, &c.*—contd.

Causes of Death.	All Races.	Nationality.						
		Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.
162.—Other Diseases peculiar to Early Infancy	4	—	—	3	—	1	—	—
163.—Lack of Care	—	—	—	—	—	—	—	—
XIII.—Old Age.								
164.—Senility	265	1	15	130	40	70	8	1
XIV.—External Causes.								
165.—Suicide by Solid or Liquid Poisons (Corrosive substances excepted)	6	1	—	4	1	—	—	—
166.—Suicide by Corrosive substances	3	—	1	1	1	—	—	—
167.—Suicide by Poisonous Gas	—	—	—	—	—	—	—	—
168.—Suicide by Hanging or Strangulation	6	—	—	2	4	—	—	—
169.—Suicide by Drowning	1	—	—	1	—	—	—	—
170.—Suicide by Firearms	—	—	—	—	—	—	—	—
171.—Suicide by Cutting or Piercing Instruments	1	—	—	1	—	—	—	—
172.—Suicide by Jumping from high places	—	—	—	—	—	—	—	—
173.—Suicide by Crushing	—	—	—	—	—	—	—	—
174.—Suicide by other means	—	—	—	—	—	—	—	—
175.—Poisoning by Food	3	—	—	—	2	—	—	1
176.—Poisoning by Venomous Bites and Stings—								
a. Snake-bite	2	—	—	1	—	—	—	1
b. Insect Stings	—	—	—	—	—	—	—	—
c. Other Venomous Poisonings	—	—	—	—	—	—	—	—
177.—Other Acute Accidental Poisonings	2	—	—	1	1	—	—	—
178.—Conflagration	—	—	—	—	—	—	—	—
179.—Accidental Burns (Conflagration excepted)	26	1	1	16	4	1	—	3
180.—Accidental Mechanical Suffocation	3	1	—	2	—	—	—	—
181.—Accidental Absorption of Irrespirable, Irritating, or Poisonous Gas	1	—	—	1	—	—	—	—
182.—Accidental Drowning	14	—	1	10	1	2	—	—
183.—Accidental Traumatism by Firearms (Wounds of War excepted)	1	—	—	1	—	—	—	—
184.—Accidental Traumatism by Cutting or Piercing Instruments	1	—	—	1	—	—	—	—
185.—Accidental Traumatism by Falls—								
a. From Trees	6	—	—	4	1	—	—	1
b. From Heights other than Trees	1	—	—	—	1	—	—	—
c. Traumatism by other Accidental Falls	18	1	1	10	5	1	—	—
186.—Accidental Traumatism in Mines and Quarries	—	—	—	—	—	—	—	—
187.—Accidental Traumatism by Machines	1	—	—	1	—	—	—	—
188.—Accidental Traumatism by other Crushing—								
a. Cart or Carriage	3	—	—	1	2	—	—	—
b. Landslides	—	—	—	—	—	—	—	—
c. Motor Vehicles	21	—	1	13	4	2	—	1
d. Railways	5	—	1	3	—	—	1	—
e. Others under this title	18	—	—	10	7	1	—	—
189.—Injuries by Animals (Poisoning by Venomous Bites and Stings excepted)	1	—	—	1	—	—	—	—
190.—Wounds of War	—	—	—	—	—	—	—	—
191.—Execution of Civilians by Belligerent Armies	—	—	—	—	—	—	—	—
192.—Starvation (Hunger or Thirst)	4	—	—	4	—	—	—	—
193.—Excessive Cold	—	—	—	—	—	—	—	—
194.—Excessive Heat	—	—	—	—	—	—	—	—
195.—Lightning	1	—	—	—	1	—	—	—
196.—Electricity (Lightning excepted)	1	—	—	—	1	—	—	—
197.—Homicide by Firearms	2	—	—	2	—	—	—	—
198.—Homicide by Cutting or Piercing Instruments	17	—	—	12	4	1	—	—
199.—Homicide by other means	6	—	—	3	1	—	—	2
200.—Infanticide (murder of infant less than 1 year of age)	—	—	—	—	—	—	—	—
201.—Fractures (cause not specified)	5	—	—	5	—	—	—	—
202.—Other External Violence—								
a. Judicial Execution	16	—	—	12	2	—	—	2
b. Others under this title	2	—	—	2	—	—	—	—
203.—Violent deaths of unknown causation	—	—	—	—	—	—	—	—
XV.—Ill-defined Diseases.								
204.—Sudden death	—	—	—	—	—	—	—	—
205.—Cause of death not specified or ill-defined—								
a. Dropsy	4	—	—	3	1	—	—	—
b. Heart Failure	9	2	3	1	3	—	—	—
c. Pyrexia	48	—	—	26	7	13	1	1
d. Other Ill-defined diseases	17	—	1	12	3	1	—	—
e. Not specified or unknown	—	—	—	—	—	—	—	—

VI.—Infant Mortality.

The problem of infant mortality received serious attention first in France where, owing to a rapidly declining birth-rate, babies attained what economists call a "scarcity-value", and the State awoke to the fact that, if the nation was to be saved and preserved, the appalling wastage of life in the first year of life—which was to a great extent preventable—had to be checked and accordingly, the institutions known as Consultations de Nourrissons and the Gouttes de lait were established. In England attention was drawn to the problem by the facts revealed during medical inspections of children entering the primary schools and also very forcibly during the medical examination of recruits for the Great War. At both these examinations it was discovered that the poor physique of many of the candidates was due to damage received in the very early years of life. For a high infant mortality rate represents not only the actual deaths from disease but also a great number of physical defects and poor health in those who survive and make the men and women of the future. Whereas a great number of the English recruits were of the C 3 grade, the recruits from countries like New Zealand, Australia, and Canada, where the infant mortality rates were low, were A 1 and splendid specimens of physical strength and health. "A healthy infancy is a natural prelude to a vigorous youth and manhood and a capacity for doing a full share of the world's work." These revelations made people sit up and think and today in every civilized country it is a leading problem of preventive medicine, public health, and social service, and not only the medical profession but also the general public are taking an interest in it and demanding action. In Ceylon, owing to our high birth-rate, babies have as yet no "scarcity-value" but the public interest shown is a good sign that people realize the value not only of saving lives but also of ensuring that the next generation shall be of a higher grade and quality. The expectation of life of an Indian child is said to be about 25 years (I presume in the case of Ceylon it is not much greater) as compared with 55 for an English child, which is clear proof of the low physical vitality of the former which in turn implies a low mental vigour. If we want an A 1 race, we must start at the point life begins.

In Colombo, the first practical step in dealing with this problem was taken in the year 1906, when 6 Municipal midwives were appointed in order to render free service to poor women at childbirth. In every country, where this problem has been seriously tackled, it has been found that it responds very readily and easily to practical measures. Infant mortality is not a problem of sanitation alone, but is due to many and various causes associated chiefly with the question of motherhood, and when we remember that infant deaths form more than 20 per cent. of all deaths in Colombo and that it is more easily controlled than the general death-rate, money, thought, time, and energy spent upon this problem are well repaid. Colombo has every reason to congratulate itself upon the progress it has so far made. Diagram I. shows that in the year 1898, the infant mortality rate was 375 per 1,000 births; it rose to 410, the maximum recorded, in the year 1903, since when it has with slight fluctuations dropped to 172 in 1931. If we smooth out the fluctuations by taking quinquennial averages, we shall see in Table 11 that the trend has been steadily downwards.

During the quinquennium 1906-1910, the fall was 16·5 per cent. and this good result was undoubtedly—at least in part—due to the appointment of 6 midwives, and the provision of the free services of trained midwives. In the next quinquennium 1911-1915, the fall was not so great but it was considerable. During this period, the number of midwives was seven—an increase of only one—and there were four nurses, but at this period the work of the nurses, which consisted in home visiting and advice, had borne no fruit. In the next quinquennium 1916-1920, the fall was greater being 12·2 per cent. showing that the work of the eight nurses was beginning to produce good results. In the next quinquennium 1921-1925, the fall was the smallest, being only 3·2 per cent. Though the staff of nurses was increased to eleven there was no increase of midwives, but two great and important steps were taken by the appointment of a whole-time Medical Officer and by the free issue of milk to poor mothers unable to breast-feed their babies. In the next quinquennium 1926-1930, the fall was greatest and most encouraging, being 21·8 per cent. During this period (see Diagram I.) great progress was made. The staff of nurses was increaseed to 17, midwives to 12. A Superintendent of Nurses, fully qualified in general and maternity nursing and trained at Bedford College, London, and at Birmingham in Child Welfare work, was appointed, and a splendid fully-equipped centre was opened in St. Paul's ward (see Photograph II.) the most densely populated, poorest, and slummiest ward of the city. Welfare work was properly organized; the quantity of free milk distributed was increased; ante and post-natal clinics were held weekly at 6 places (at the centre and at 5 Municipal dispensaries); babies were regularly weighed and advice given on feeding; ailments of expectant mothers and infants were treated at the Municipal dispensaries. These measures were bound to have good results as experience in other countries had invariably showed. During 1931, still further progress was made by the opening of 2 other centres at Slave Island and Maradana, by increasing the staff to 21 nurses and 16 midwives, and by giving free ostelin and cod liver oil to mothers and babies with the result that the rate dropped from 179 in 1930 to 172 in 1931—a small drop it is true, but nevertheless satisfactory having regard to the financial depression in the country and consequent widespread unemployment, poverty, and hardship among the labouring classes.

(11) *Infant Mortality Rates—Quinquennial Averages, 1901 to 1930.*

Period.	Rate per 1,000 Births.	Percentage Fof all.
Average 1901 to 1905 ...	375 ...	—
Average 1906 to 1910 ...	313 ...	16·5
Average 1911 to 1915 ...	286 ...	8·6
Average 1916 to 1920 ...	251 ...	12·2
Average 1921 to 1925 ...	243 ...	3·2
Average 1926 to 1930 ...	190 ...	21·8
1931	172 ...	—

DIAGRAM I

INFANT MORTALITY

RATE PER 1000 BIRTHS

1898-1931

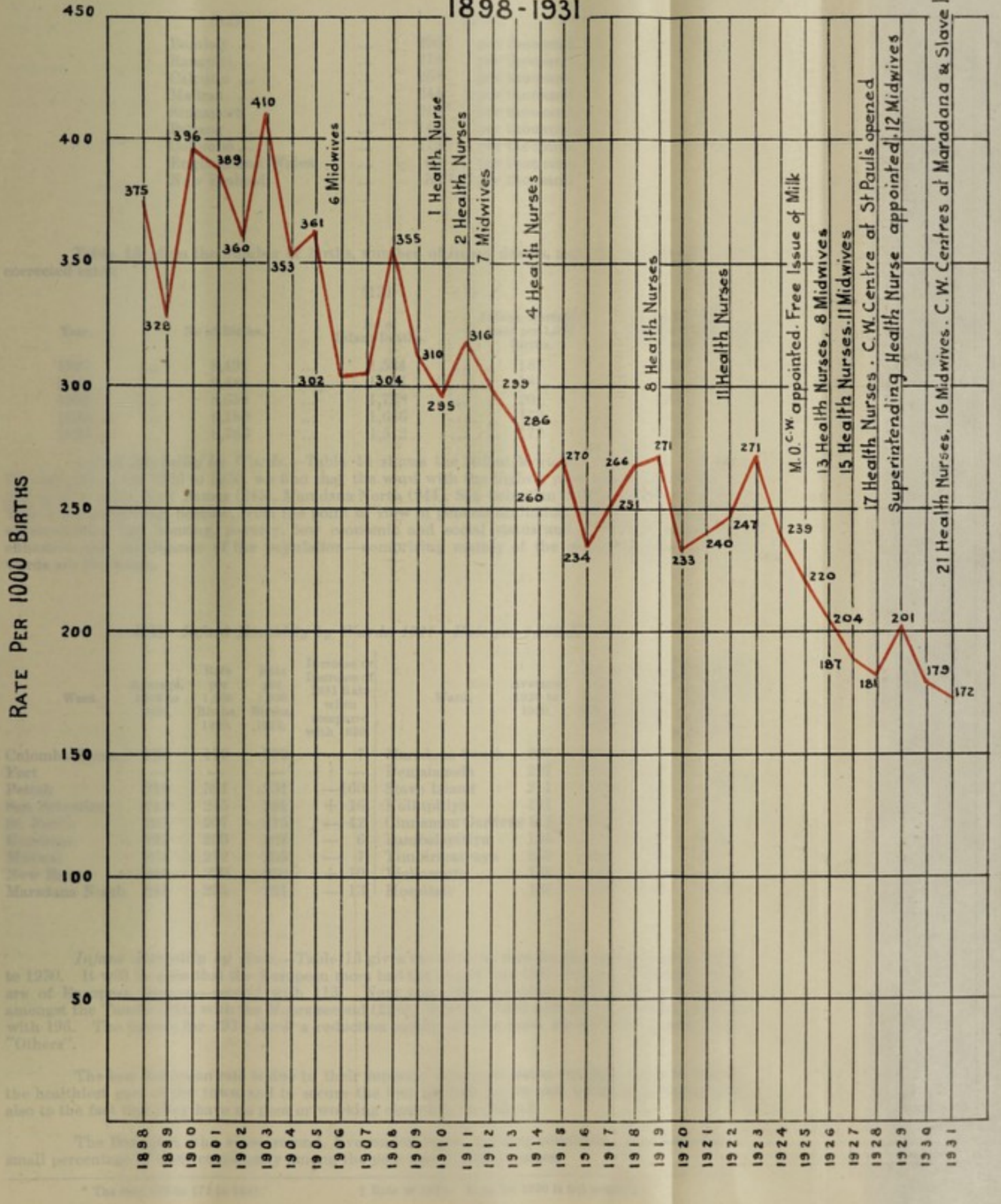


Table 12 gives the infant mortality rates for 1930 (latest available) obtaining in the principal towns in India, Burma, Ceylon, and Malaya between latitudes 1° and 23° north, and for purposes of comparison are given the infant mortality rates of England and Wales and New Zealand, which has the honour of having the lowest infant mortality rate of any country in the world. Colombo, though it compares favourably with the other Eastern towns, cannot yet be proud of or happy with her rate compared with the rates of England and Wales and New Zealand. It is of course futile to hope to reach such low figures in the near future, but if we can find the money and make the effort, I am sure we can reduce our rate very much more.

(12)

		1930.	
Bombay ...	...	296	per thousand.
Rangoon ...	...	278	per thousand.
Calcutta ...	...	268	per thousand.
Madras ...	...	244	per thousand.
Singapore	...	219	per thousand.
Penang ...	...	144	per thousand,
Colombo ...	...	179*	per thousand.
England and Wales	...	60	per thousand.
New Zealand	...	38·74†	per thousand.

Table 13 gives the number of births, number of infant deaths, and the uncorrected and corrected rates.

(13)

Year.	No of Births.	No of Infant Deaths.	Infant Mortality Rate per 1,000 Births.	Infant Mortality Rates corrected for Non-residents.
1927 ...	8,491 ...	1,584 ...	187 ...	196
1928 ...	9,486 ...	1,714 ...	181 ...	189
1929 ...	8,659 ...	1,738 ...	201 ...	208
1930 ...	9,180 ...	1,646 ...	179 ...	186
1931 ...	8,783 ...	1,512 ...	172 ...	177

Infant Mortality by Wards.—Table 14 shows the Infant Mortality by wards. Taking the quinquennium 1926 to 1930, we find that the ward with the highest rate was St. Paul's (261), and next in order New Bazaar (245), Maradana North (244), San Sebastian (242), and Mutwal (234). This is not surprising, because, from the point of view of general sanitation, density of population, overcrowding, bad housing, poverty, low economic and social status and low level of general education and intelligence of the population—comprising mainly of the working classes—these wards are the worst.

(14) *Infant Mortality by Wards, 1931—Rate per 1,000 Births.*

Ward.	Average, 1926 to 1930.	Rate per 1,000 Births, 1930.	Rate per 1,000 Births, 1931.	Increase or Decrease of 1931 Rate when compared with 1930.	Ward.	Average, 1926 to 1930.	Rate per 1,000 Births, 1930.	Rate per 1,000 Births, 1931.	Increase or Decrease of 1931 Rate when compared with 1930.
Colombo Town	190	179	172	— 7	Maradana South	227	204	218	+ 14
Fort	—	—	—	—	Dematagoda	227	224	248	+ 24
Pettah	219	391	231	—160	Slave Island	211	208	183	— 25
San Sebastian	242	245	261	+ 16	Kollupitiya	147	133	152	+ 19
St. Paul's	261	257	215	— 42	Cinnamon Gardens	173	185	90	— 95
Kotahena	222	203	197	— 6	Bambalapitiya	135	135	162	+ 27
Mutwal	234	212	205	— 7	Timbirigasyaya	182	165	134	— 31
New Bazaar	245	220	230	+ 10	Wellawatta	138	133	114	— 19
Maradana North	244	234	221	— 13	Hospitals	136	133	130	— 3

Infant Mortality by Race.—Table 15 gives the rates by race for the quinquennium 1926 to 1930. It will be seen that the European races had the lowest rate (25) with the Burghers—who are of European descent—second with 113. Next came the Sinhalese. The highest rate was amongst the Tamils (241) with the Moors second (228), "Others" third with 214, and Malays fourth with 196. The figures for 1931 show a reduction among all the races except the European and "Others".

The low European rate is due to their superior economic status enabling them to live in the healthiest part of the town and to secure the best medical advice and nursing attention, and also to the fact that they have no poor or working classes in the Island.

The Burghers, who come second, live under better sanitary conditions, and have but a small percentage of their community among the poor and working classes.

* The rate fell to 172 in 1931.

† Rate in 1928. Rate for 1930 is not available.

The high Tamil rate is due to the fact that by far the largest percentage of the poor working classes is composed of this race—their women folk also work very hard and almost up to the moment of confinement to supplement their meagre income. The Tamils of the working classes have no education, and are of a low order of intelligence. By reason of their economic condition, they work the hardest and earn the least, and live in the very lowest and most crowded quarters of the town. Owing to the mothers' employment and malnutrition, children are weaned early and fed artifically.

The Moors who come next are of a better economic status, but their social customs and practices are hurtful. Early marriage of their women, custom of purdah, ignorance of their women folk, lack of exercise in the open air, lack of ante-natal attention and proper medical aid and nursing during childbirth all contributed to a high rate.

The Malays, though Muslims by religion, are not so strict in the observance of purdah; their women have more freedom and are, on the whole, more progressive in their habits and manner of life. The rate for 1931, 165, is an improvement on the average 196, and a great reduction over the rate for 1930 which was 222 (*vide* Table 15).

(15) *Infant Mortality by Race, 1926 to 1931.*

Race.	1926.	1927.	1928.	1929.	1930.	Average, 1926 to 1930.	1931.
All Races ...	204	187	181	201	179	190	172
Europeans ...	46	11	22	24	22	25	25
Burghers ...	124	77	122	136	105	113	95
Sinhalese ...	189	180	175	190	167	180	167
Tamils ...	266	245	218	253	221	241	186
Moors ...	251	224	205	241	221	228	223
Malays ...	239	174	164	182	222	196	165
Others ...	252	203	206	222	187	214	235

(16) *Infant Mortality by Race, 1931. Number of Infant Deaths and Rate per 1,000 Births.*

Race.	No. of Infant Deaths, 1931.	Rate per 1,000 Births, previous Year.	Rate per 1,000 Births, 1931.	Increase or Decrease of 1931 Rate when compared with 1930 Rate.
All Races ...	1,512	179	172	— 7
Europeans ...	2	22	25	+ 3
Burghers ...	53	105	95	—10
Sinhalese ...	885	167	167	—
Tamils ...	234	221	186	—35
Moors ...	249	221	223	+ 2
Malays ...	51	222	165	—57
Others ...	38	187	235	+48

Causes of Infant Mortality.—These may be divided into—

(A) General causes and (B) Special or pathological causes.

(A) *General Causes.*—These are common to all countries, climes, and peoples, and, as the manner in which they operate is fairly obvious, it is not necessary to go into them in detail.

The principal general causes are—

(1) *Poverty.*—Greatest predisposing factor. It implies slum life, bad housing, overcrowding, insanitation, food insufficient in quantity and poor in quality and nutritive value, employment of mother during pregnancy resulting in premature birth or birth of a weakling, employment of mother soon after confinement resulting in premature weaning and artificial feeding on cheap patent foods, inadequate clothing, inability to pay for proper medical attention or skilled nursing at childbirth, lack of rest for mother, poor health.

We have as yet no reliable statistics to prove this as regards Colombo, but it has been proved in other countries without a shadow of doubt that the poor man's child has a very much smaller chance of surviving the first year of life than the rich man's child.

In the town of Erfurt in Germany, Wolf found that—

505 out of 1,000 infants died among the working class.
173 out of 1,000 infants died among the middle class.
89 out of 1,000 infants died among the rich class.

In Birmingham, Dr. Robertson found the infant mortality rate was 200 per 1,000 among the poor and 50 per 1,000 among the middle and rich.

Poverty may be primary, due to inadequate wages or earnings, or secondary, due to improvidence, gambling, drinking, cinema going, &c. We have large numbers of people in Colombo never above the "poverty line" and we have seen above how high the rates were in those wards mainly inhabited by the working classes. "The curse of the poor is their poverty".

(2) *Illegitimacy.*—Naturally the rate among illegitimate children is higher than among legimate ones. The unmarried woman, carrying a baby, makes efforts to hide her condition by tight clothing and lacing, or to bring about an abortion by consuming patent nostrums or irritant concoctions. If she does not succeed, the unwanted child—the evidence of her shame—is neglected or given away to be brought up by some other woman who has neither affection for nor interest in it with the result that it soon fades away.

(3) *Age of Mother.*—We have as yet not gathered sufficient evidence to make a definite statement in regard to the influence of this factor in Colombo, but the general result of investigations elsewhere shows that it exerts an important influence upon infant mortality. With the youngest mothers, the number of weakly children is greatest, and the mortality rate is also higher for the youngest and also for the oldest mothers.

The best child-bearing period for a woman would appear to be between the ages of 20 and 30 years. Children of immature youths or of decrepit old men are also handicapped for life.

(4) *Order of Birth.*—First born children have a slightly higher rate than subsequent children due to difficulty in parturition and inexperience and sometimes age of mother—too young or too old. The mortality rate rises again with increasing number of births.

(5) *Interval between Births.*—When the spacing between births was short—that is one or two years—it exerted an influence upon mortality. When babies keep coming in quick succession, they also depart at the same rate.

(6) *Plurality of Birth.*—The rate among twins and triplets is higher than among single born infants.

(7) *Prematurity of Birth.*—The mortality among the prematurely born is said to be about six times as high as that of babies born at full term.

(8) *Type of Birth.*—Infants born naturally have a lower mortality rate than those delivered by means of instruments.

(9) *Inexperience and Ignorance and Lack of Intelligence.*—Due to poor general education and absence of training in mother-craft, personal and domestice hygiene, and domestic economy.

(10) *Hereditary Influences.*—Due to syphilis and alcoholism.

(11) *Artificial Feeding.*—Women of the upper classes *will not* breast-feed their children long enough owing to their many social engagements and from a fear of losing their "figure". On the other hand, women of the poorer classes have to wean their babies prematurely because they *cannot* breast-feed them long enough owing to the necessity of having to go out to work to supplement the husbands' earnings, or owing to absence of breast milk due to their own poor health and malnutrition.

(12) *Racial Influence.*—In Europe and America the rate among the Jews, however poor they may be and however unfavourable their environment, is much lower than among other races. This has been found to be due to their innate characteristics. They make excellent mothers, always breast-feed their babies, and married women do not go out to work as a rule. The Jewish mother does not delegate her duty to a cow, but feeds and tends her infant with the greatest care with the result that, in spite of unfavourable surroundings and circumstances, she can save her baby's life while others, circumstanced as she is, lose theirs. How true is the French proverb "Le lait et le coeur d'une maman ne se remplacent jamais"—the milk and the heart of a mother can never be replaced.

(13) *High Birth-rate.*—A high birth-rate is frequently associated with a high infant mortality rate especially when it occurs in areas where there is overcrowding, bad sanitation, employment of women, laxity of morals, illegitimacy, drunkenness, &c.

(B) *Special or Pathological Causes.*—These operate at certain times and under special circumstances, and the great majority of them may be grouped under three heads:—

(*a*) Developmental Diseases,

(*b*) Digestive Diseases, and

(*c*) Respiratory Diseases.

(*a*) *Developmental Diseases.*—(Premature birth, atelectasis, atrophy, debility, and rickets). Taking all together, the average rate for the quinquennium 1926 to 1930 was 83 per 1,000 births, as against 87 for the previous quinquennium showing a small reduction. The rate for 1931 was also 83 (*vide* Table 17).

(17) *Causes of Infant Mortality, 1921 to 1931—Rate per 1,000 Births.*

Cause of Infant Deaths.	1921	1922	1923	1924	1925	Average, 1921-1925	1926	1927	1928	1929	1930	Average, 1926-1930	1931
Developmental Diseases ...	81	88	96	90	78	87	75	80	86	88	87	83	83
{Premature Birth	10	20	28	22	15	19	19	15	16	24	28	20	28
{Atrophy and Debility ...	67	64	65	64	60	64	43	62	67	64	57	59	52
Pneumonia and Bronchitis ...	36	36	37	31	31	34	28	30	27	31	24	28	29
Digestive Diseases	32	33	37	34	29	33	28	24	20	28	26	25	22
Convulsions	69	60	68	59	56	62	52	30	22	21	18	29	10
Tetanus Neonatorum ...	2	2	1	3	2	2	2·2	1·1	1	0·3	1·3	1·1	1·4
Tuberculosis	2	1	1	0·6	0·3	1	—	0·1	—	—	0·1	—	—
Syphilis	4	6	8	5	5	6	4	3·2	3·3	3	3	3·3	3

(18) *Causes of Infant Mortality, 1921 to 1931—Number of Deaths.*

Cause of Infant Deaths.	1921	1922	1923	1924	1925	Average, 1921-1925	1926	1927	1928	1929	1930	Average, 1926-1930	1931
Developmental Diseases ...	706	603	685	617	602	643	609	676	820	765	800	734	728
{Premature Birth	88	137	203	152	118	140	154	130	151	211	254	180	249
{Atrophy and Debility ...	585	438	460	440	458	476	352	523	636	553	527	518	461
Pneumonia and Bronchitis ...	311	251	263	213	241	256	228	254	257	268	218	245	252
Digestive Diseases	279	225	262	235	220	244	226	202	194	242	238	220	189
Convulsions	602	411	480	409	426	466	420	256	208	184	168	247	86
Tetanus Neonatorum ...	16	17	7	22	13	15	18	9	12	3	12	11	12
Tuberculosis	19	9	10	4	2	9	—	1	—	—	1	0·4	—
Syphilis	33	44	59	36	37	42	34	29	31	23	28	29	25

(*b*) *Atrophy and Debility.*—This cause claimed the largest number of deaths, the rate for the decennial period 1922-1931 being 60 per thousand (*vide* Diagram II.) and 31·0 per cent. of the total deaths (*vide* Table 19). The underlying causes for the high mortality from atrophy and debility are due to congenital conditions and the health and condition of the mother during pregnancy and parturition. Table 20 shows that the largest number of deaths occurred during the first month of life. The average rate for the quinquennium 1926-1930 being 59, as against 64 in the previous quinquennium and 52 in 1931 (*vide* Tables 17 and 18).

(*c*) *Premature Birth.*—This cause was responsible for 16·5 per cent. of the deaths in 1931 and 10·77 for the quinquennium 1926-1930, and had a rate of 22 per 1,000 for the decennial period 1922-1931 (*vide* Diagram II. and Tables 17 and 18) and a rate of 20 per 1,000 for the period 1926-1930 as compared with 19 for the previous 5-year period and 28 for 1931, showing no improvement under this head (*vide* Tables 17 and 18).

The underlying causes for these deaths are hard work of mothers during later stages of pregnancy, the health and conditions under which mother lives, illegitimacy, syphilis, &c. Reference to Table 20 shows that the largest number of deaths occurred in the first month of life.

(B) *Diseases of Digestive System.*—(Diarrhœa and enteritis, dysentery, &c.). Taking all together, they were responsible for 9·9 per cent. of all deaths, and the average rate for the decennium 1922-1931 was 24 per 1,000, as against 22 in 1931 (*vide* Diagram II. and Tables 17 and 18).

(19) *Principal Causes of Infant Mortality expressed as a Percentage of Total Infant Deaths.*

Cause of Death.	1926	1927	1928	1929	1930	Average, 1926-1930	1931
Atrophy and Debility .	21·2 ...	33·0 ...	37·1 ...	31·8 ...	32·0 ...	31·0 ...	30·5
Premature Birth ...	9·3 ...	8·0 ...	8·8 ...	12·1 ...	15·4 ...	10·7 ...	16·5
Diarrhœal Diseases ...	11·6 ...	10·7 ...	9·7 ...	12·9 ...	13·2 ...	11·6 ...	9·9
Pneumonia ...	11·0 ...	13·3 ...	12·4 ...	12·8 ...	10·4 ...	12·0 ...	12·2
Convulsions ...	25·3 ...	16·2 ...	12·1 ...	10·6 ...	10·2 ...	14·9 ...	5·7

DIAGRAM II

CAUSES OF INFANT MORTALITY

AVERAGE RATE PER 1000 BIRTHS

1922-1931.

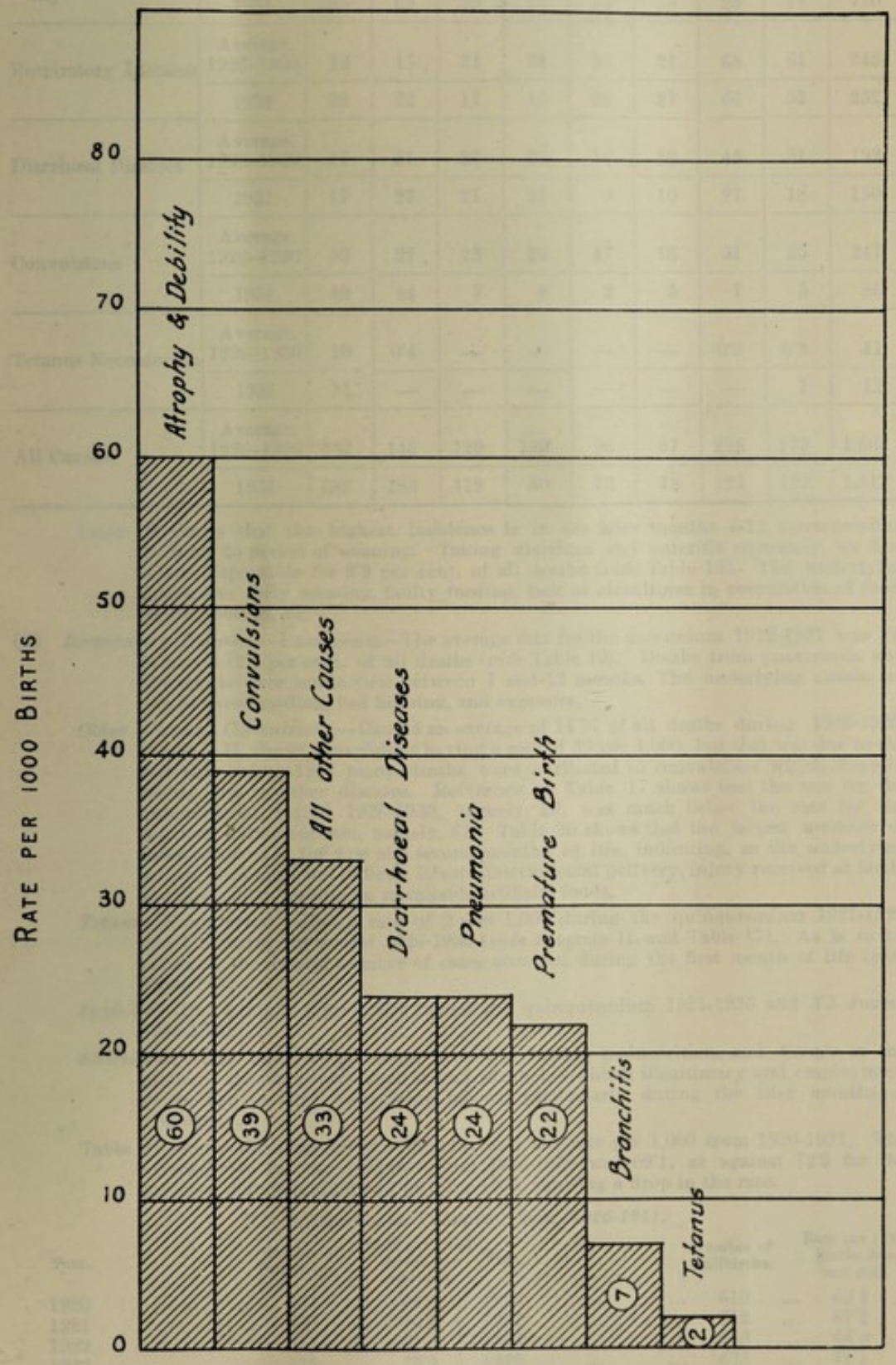


DIAGRAM 1

CAUSES OF INFANT MORTALITY

AVERAGE RATE PER 1000 BIRTHS

1922-1931.

(20) *Principal Causes of Infant Mortality—Number of Deaths at each Age Period.*

Cause.		One Month and under	2 Months.	3 Months.	4 Months.	5 Months.	6 Months.	7-9 Months.	10-12 Months	All Ages under one Year.
Premature Birth and Atrophy and Debility	Average, 1926–1930	501	54	35	26	18	16	30	17	697
	1931	525	69	39	15	13	13	25	11	710
Respiratory Diseases	Average, 1926–1930	12	15	21	24	23	21	68	61	245
	1931	23	22	17	16	29	27	66	52	252
Diarrhœal Diseases	Average, 1926–1930	17	21	27	20	16	16	45	31	193
	1931	17	27	21	21	9	10	27	18	150
Convulsions	Average, 1926–1930	82	27	23	26	17	16	31	25	247
	1931	40	14	7	8	2	5	7	3	86
Tetanus Neonatorum	Average, 1926–1930	10	0·4	—	—	—	—	0·2	0·2	11
	1931	11	—	—	—	—	—	—	1	12
All Causes	Average, 1926–1930	682	146	129	120	96	87	228	179	1,668
	1931	682	163	119	80	73	78	195	122	1,512

Table 20 shows that the highest incidence is in the later months 7-12 corresponding probably to period of weaning. Taking diarrhœa and enteritis separately, we find it was responsible for 9·9 per cent. of all deaths (*vide* Table 19). The underlying causes are: early weaning, faulty feeding, lack of cleanliness in preparation of food, feeding bottles, &c.

(C) *Respiratory Diseases.*—Pneumonia—The average rate for the decennium 1922-1931 was 24. It caused 12·2 per cent. of all deaths (*vide* Table 19). Deaths from pneumonia and bronchitis were commonest between 7 and 12 months. The underlying causes are due to overcrowding, bad housing, and exposure.

Other Causes, Convulsions.—Caused an average of 14·97 of all deaths during 1926-1930. Diagram II. shows convulsions having a rate of 39 per 1,000, but that was due to the fact that before 1927 many deaths were attributed to convulsions which were in reality due to other diseases. Reference to Table 17 shows that the rate for the quinquennial period 1926-1930, namely, 29, was much below the rate for the previous quinquennium, namely, 62. Table 20 shows that the largest number of cases occurred in the first and second months of life, indicating, as the underlying causes, prolonged and difficult labour, instrumental delivery, injury received at birth, and also faulty feeding on unsuitable artificial foods.

Tetanus Neonatorum.—Had a rate of 2 per 1,000 during the quinquennium 1921-1925 and 1·1 during the period 1926-1930 (*vide* Diagram II. and Table 17). As is to be expected, the largest number of cases occurred during the first month of life (*vide* Table 20).

Syphilis.—Had a rate of 6 per 1,000 during the quinquennium 1921-1925 and 3·3 during 1926-1930.

Stillbirths.—The underlying causes are: bad health, malnutrition, and disease in the mother; specific poisons such as lead, alcohol, syphilis; illegitimacy and employment of mother in hard, exhausting labour, particularly during the later months of pregnancy.

Table 21 shows the number of stillbirths and the rate per 1,000 from 1920-1931. The average rate for the quinquennium 1926-1930 was 69·1, as against 72·9 for the previous quinquennium and 66·6 for 1931, showing a drop in the rate.

(21) *Stillbirths in Colombo Town, 1920-1931.*

Year.	Number of Stillbirths.	Rate per 1,000 Births live and still.	Year.	Number of Stillbirths.	Rate per 1,000 Births live and still.
1920	532	68·8	1926	610	69·9
1921	660	70·3	1927	612	67·2
1922	611	81·6	1928	693	68·0
1923	579	75·3	1929	673	72·1
1924	489	66·3	1930	675	68·5
1925	584	70·8	Average, 1926-1930 ...	653	69·1
Average, 1921-1925 ...	585	72·9	1931	627	66·6

(22) *Infant Mortality—Deaths at different Age Periods and from Several Causes.—1931.*

Cause of Death.	Age.												Race.							
	Age in Weeks.					Age in Months.							Europeans.	Burghers.	Sinhalese.	Tamils.	Moors.	Malays.	Others.	All Races.
	1	2	3	4	Total.	2	3	4	5	6	7–9	10–12	Total.								
I.—Developmental Diseases:—																				
1. Premature birth ...	208	18	12	2	240	5	2	—	—	—	2	—	9	—	7	189	29	10	6	8	249
2. Atalectasis ...	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1
3. Atrophy and Debility	200	34	18	33	285	64	37	15	13	13	23	11	176	—	11	239	92	95	11	13	461
4. Rickets ...	—	1	—	—	1	2	1	1	1	3	5	3	16	—	1	9	2	2	3	—	17
II.—Diseases of Respiratory System :—																				
1. Laryngitis ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Croup ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Bronchitis ...	2	2	3	4	11	6	5	3	8	6	18	10	56	—	4	26	12	18	4	3	67
4. Pneumonia ...	2	2	1	7	12	16	12	13	21	21	48	42	173	—	10	127	22	16	3	7	185
5. Others ...	2	—	—	—	2	—	—	1	—	—	—	1	2	—	1	2	—	1	—	—	4
III.—Diseases of Digestive System :—																				
1. Diarrhœa and Enteritis	1	2	4	10	17	27	21	21	9	10	27	18	133	1	9	97	16	20	6	1	150
2. Dysentery ...	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	1	—	—	—	—	1
3. Others ...	3	5	—	3	11	6	1	2	—	3	5	7	24	—	2	12	8	10	3	—	35
IV.—Diseases of Nervous System :—																				
1. Convulsions ...	25	6	5	4	40	14	7	8	2	5	7	3	46	—	—	53	18	10	3	2	86
2. Laryngismus stridulus	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Tetanus ...	3	8	—	—	11	—	—	—	—	—	—	1	1	—	1	7	1	3	—	—	12
4 Others ...	1	1	—	—	2	—	1	—	—	—	—	—	1	—	—	3	—	—	—	—	3
V.—Tuberculous Diseases:—																				
1. Tabes mesenterica ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Tubercular meningitis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Others ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
VI.—Accidents:—																				
1. Injury ...	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
2. Umbilical hæmorrhage	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Suffocation ...	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	1	—	—	—	—	1
4 Other violence ...	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	1
VII.—Infectious Diseases:—																				
1. Smallpox ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Chickenpox ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3. Measles ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4. Whooping cough ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5. Mumps ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6. Diphtheria ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7. Influenza ...	7	5	2	11	25	16	23	11	13	11	52	21	147	—	5	74	22	56	11	4	172
8. Enteric fever ...	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	1	—	—	—	—	1
VIII.—Syphilis ...	1	—	2	1	4	4	6	4	1	3	3	—	21	—	1	16	8	—	—	—	25
IX.—All other causes ...	10	3	2	3	18	3	3	1	5	2	4	4	22	1	1	26	4	7	1	—	40
Total ...	468	87	49	78	682	163	119	80	73	78	195	122	830	2	53	885	234	249	51	38	1512

VII.—Infectious Diseases (General.)

Plague, phthisis, and whooping cough showed an increase; and chickenpox, measles, diphtheria, enteric fever, continued fever, and dysentery showed a decrease over previous year.

(23) *Notifiable Infectious Diseases, 1931.* (*Monthly Incidence.*)

Disease.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Town Cases, 1931.	Total Town Cases previous Year.
Plague	4	16	8	2	2	2	5	3	2	2	1	—	47	40
Cholera	—	—	—	—	—	—	—	1	—	—	2	—	3	—
Smallpox	—	—	—	—	—	—	—	—	—	—	—	—	—	2
Chickenpox ...	75	69	137	97	45	17	11	17	26	50	28	20	594	897
Measles	4	2	6	1	5	—	1	2	—	3	—	3	27	134
Diphtheria	5	—	3	1	2	3	4	—	1	—	—	1	20	23
Acute Diarrhœa ...	—	1	—	—	—	—	—	—	1	—	2	—	4	1
Enteric Fever ...	37	27	37	30	31	21	19	25	20	12	10	10	279	373
Continued Fever ...	9	9	14	9	7	6	15	9	6	11	5	3	103	137
Phthisis	96	77	77	65	56	89	89	100	101	72	79	77	978	918
Dysentery	15	9	17	5	12	9	34	33	32	24	23	20	233	411
Whooping Cough ...	6	2	6	4	2	14	21	7	9	11	12	11	105	37
Pneumonia	—	—	—	—	—	70	112	112	58	53	73	58	536	—*
Mumps	—	—	—	—	—	5	11	2	2	2	6	3	31	—*
Puerperal Pyrexia ...	—	—	—	—	—	4	7	5	12	11	14	12	65	—*

* Pneumonia, mumps, and puerperal pyrexia were declared notifiable diseases on June 1, 1931.

VIII.—Plague.

Human Plague.—47 cases of human plague occurred during the year, as against 40 cases in 1930. The number of deaths was 45, representing a case mortality of 97·9 per cent.

Of the 47 cases, 17 were septicæmic in type with a case mortality of 100 per cent.; 29 were bubonic with 27 deaths, representing a case mortality of 93·1 per cent.

There was a sharp outbreak of plague in Kotahena about the end of January, 1931. The first case originated at No. 23, Shoe road, but was unrecognized and certified as "cerebral malaria". The second case, which occurred at No. 33, Ambalama road, was infected from the first case, and on subsequent investigation was declared a case of primary pneumonic plague. Five other cases occurred in the same house in quick succession. One of these was found to be bubonic in type and the rest septicæmic, but nearly all the cases showed marked involvement of lungs.

Monthly Incidence.—February had the largest number of cases, viz. 15. Of the 47 cases, 28 occurred during the first quarter.

Sex Incidence.—Of the 47 cases, 42 were males and 5 females.

Racial Incidence.—22 cases, all fatal, occurred among the Tamils and 17 cases, all fatal, among the Moors. There were 6 cases with 4 deaths among the Sinhalese, and one fatal case each among the Burghers and Malayalees.

Distribution by Wards.—St. Paul's, as usual, had the largest number of cases, viz., 21. There were 8 cases of plague in Kotahena and 7 in Pettah. 3 cases occurred in San Sebastian, and 1 each in Maradana North, Dematagoda, and Kollupitiya. 5 cases were untraced.

Rat Plague.—28,051 rats were examined at the Municipal Laboratory and 24 were found infected. Of the infected rats, 5 were sent from the Chalmers Granaries and 1 from Manning Market.

(24) *Human Plague, 1931.*

Distribution by Wards.

Ward.	No. of Cases.	No. of Deaths.
Fort	—	—
Pettah	7	7
San Sebastian ...	3	3
St. Paul's	21	19
Kotahena	8	8
Mutwal	—	—
New Bazaar ...	—	—
Maradana North ...	1	1
Maradana South ...	—	—
Dematagoda ...	1	1
Slave Island ...	—	—
Kollupitiya ...	1	1
Cinnamon Gardens ...	—	—
Bambalapitiya ...	—	—
Timbirigasyaya ...	—	—
Wellawatta ...	—	—
No Fixed Residence ...	1	1
Untraced ...	4	4
Total ...	47	45

(25) *Human Plague in Colombo during the Year 1931—Distribution by Race, Sex, and Age.*

Race.	Sex.	0 to 5 Years.	5 to 10 Years.	10 to 15 Years.	15 to 20 Years.	20 to 25 Years.	25 to 30 Years.	30 to 35 Years.	35 to 40 Years.	40 to 50 Years.	50 to 60 Years.	60 Years and Over.	Total.	Total of each Race.	Number of Deaths.	Case Mortality Per Cent.
All Races ...	Males ...	—	2	4	9	8	5	1	1	5	3	4	42	47	45	97·9
	Females ...	—	—	—	—	—	2	—	—	—	1	2	5			
Europeans ...	Males ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Females ...	—	—	—	—	—	—	—	—	—	—	—	—			
Burghers ...	Males ...	—	—	—	—	1	—	—	—	—	—	—	1	1	1	100
	Females ...	—	—	—	—	—	—	—	—	—	—	—	—			
Sinhalese ...	Males ...	—	1	1	1	2	1	—	—	—	—	—	6	6	4	66·7
	Females ...	—	—	—	—	—	—	—	—	—	—	—	—			
Tamils ...	Males ...	—	—	—	3	3	2	1	—	4	2	3	18	22	22	100
	Females ...	—	—	—	—	—	1	—	—	—	1	2	4			
Moors ...	Males ...	—	1	3	5	2	2	—	1	—	1	1	16	17	17	100
	Femaels ...	—	—	—	—	—	1	—	—	—	—	—	1			
Malays ...	Males ...	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Females ...	—	—	—	—	—	—	—	—	—	—	—	—			
Others ...	Males ...	—	—	—	—	—	—	—	—	1	—	—	1	1	1	100
	Females ...	—	—	—	—	—	—	—	—	—	—	—	—			

(26) *Work done by Anti-Plague Staff.*

(*a*) By Cleansing Gang.

Ward.	No. of Dwellings claytonized.	No. of Dwellings unroofed.	No. of Rat-holes claytonized.	No. of Rats killed by Claytons.	No. of dead Rats found.	No. of mummified Rats found.	No. of Houses pesterined.	No. of Houses disinfected.	No. of Nests found.	Cart Loads of Rubbish removed.
St. Paul's	5,302	5,302	5,449	2,471	135	47	1,423	3,818	6	196
Pettah	1,432	1,432	1,799	2,302	78	95	123	1,303	15	107½
Kotahena	409	409	488	132	5	—	166	285	—	17½
New Bazaar	304	304	548	135	—	—	95	203	2	12½
Dematagoda	548	548	826	289	12	19	288	277	2	23½
Wellawatta	7	7	4	1	—	—	—	—	—	—
Bambalapitiya	86	86	167	89	2	—	29	49	—	9½
Kollupitiya	5	5	26	14	—	—	—	—	—	—
San Sebastian	1,054	1,054	1,068	469	5	—	244	809	3	41½
Slave Island	803	803	754	239	2	—	197	609	8	25½
Mutwal	442	442	523	205	2	—	165	283	6	17½
Maradana North ...	628	628	508	232	12	—	244	408	11	29½
Maradana South ...	520	520	775	353	2	3	130	374	4	20½
Cinnamon Gardens ...	1	1	9	3	—	—	—	—	—	—
Total ...	11,541	11,541	12,944	6,934	255	164	3,104	8,418	57	502½

(27) *Work done by Anti-Plague Staff.*

(*b*) By Trapping Gang.

Month.	No. of Rats trapped.	No. of recently dead Rats found.	Month.	No. of Rats trapped.	No. of recently dead Rats found.
January ...	6,693	33	September ...	6,718	82
February ...	6,972	37	October ...	7,141	34
March ...	7,592	26	November ...	7,014	72
April ...	5,818	7	December ...	6,999	27
May ...	6,499	27			
June ...	7,645	12	Total ...	83,251	455
July ...	7,164	13			
August ...	6,996	85			

(28) *Number of Rats trapped at Chalmers Granaries, Manning Markets, and Customs Premises for the Year 1931.*

Month.	No. of Rats trapped in the Customs Premises.	No. of dead Rats found.	No. of Rats trapped in Chalmers Granaries.	No. of dead Rats found.	No. of Rats trapped in Manning Market.	No. of dead Rats found.
January ...	216	—	183	15	58	1
February ...	159	—	255	8	52	3
March ...	187	—	158	7	95	—
April ...	109	—	52	6	46	—
May ...	157	—	87	17	34	—
June ...	113	—	77	6	41	—
July ...	198	—	85	2	24	—
August ...	190	—	283	63	65	8
September ...	196	—	267	67	45	1
October ...	175	—	121	27	149	—
November ...	177	—	123	54	101	9
December ...	154	—	148	22	52	2
Total ...	2,031	—	1,839	294	762	24

Anti-Plague Organization.

Until the end of 1930 anti-plague work was divided between the Veterinary Department and the Public Health Department; the former being responsible for the trapping and destruction of rats and the latter for the other plague measures. As from the beginning of 1931, the rat destruction work was transferred to the Public Health Department, and the staff consisting of 1 Sub-Inspector, 1 clerk, 13 overseers, and 69 coolies was placed under the direction and control of the Medical Officer of Health.

Anti-plague work was properly organized and a whole-time Inspector was appointed, under whose immediate supervision both the rat destruction work and the fumigation, pesterining, and other anti-plague measures are carried on.

The Plague staff now consists of—

One Inspector-in-charge.
One Clerk.

Rat Destruction Branch.
One Sub-Inspector.
Eleven Overseers.
Fifty-nine Coolies.

Fumigation Branch.
One Sub-Inspector.
Six Overseers.
Six Masons.
Forty-three Coolies.

Under the new scheme of organization it was possible to reduce the staff by 2 overseers, 6 masons, and 22 coolies, thus effecting a saving to Council under head of staff of Rs. 8,697·97.

Further savings to the extent of Rs. 3,381·27 was effected by stopping Sunday work, discontinuing use of kerosine oil, barium carbonate, and rice flour. The total savings effected per annum is Rs. 12,079·24.

IX.—Smallpox and Vaccination.

No cases of smallpox occurred in the city, but two port cases were reported.

The following statement shows the number of births and primary vaccinations for the years 1923-1931.

(29) *Births and Primary Vaccinations.*

Year.	No. of Births.	Total Number of Primary Vaccinations performed in the City.	Deficit or Excess.
1923 ...	7,107 ...	6,192 ...	− 915
1924 ...	6,887 ...	5,784 ...	−1,103
1925 ...	7,663 ...	5,704 ...	−1,959
1926 ...	8,114 ...	5,623 ...	−2,491
1927 ...	8,491 ...	4,545 ...	−3,946
1928 ...	9,486 ...	4,521 ...	−4,965
1929 ...	8,658 ...	7,398 ...	−1,260
1930 ...	9,180 ...	8,760 ...	− 420
1931 ...	8,783 ...	9,221 ...	+ 438

In 1931, the total number of primary vaccinations has for the first time exceeded the number of births. No vaccinations were performed during the year by officers of the Public Health Department.

X.—Chickenpox.

There were 594 town cases of chickenpox, as against 897 in the previous year; 3 port cases and 55 extra-urban cases. No deaths were registered.

XI.—Measles.

Measles showed a very considerable drop, there being only 27 town cases as, against 134 in the previous year. The extra-urban cases numbered 2. There were no deaths.

XII.—Diphtheria.

There were 20 town cases, as against 23 in the previous year, and 11 extra-urban cases. Total number of deaths 6—corrected for non-residents in hospitals 3.

XIII.—Whooping Cough.

There were 105 town cases and 3 deaths, as against 37 cases and 2 deaths in previous year. The extra-urban cases numbered 8 with no deaths.

Schools are mainly responsible for the spread of this disease, infection being disseminated before the true nature of the disease is recognized.

XIV.—Pulmonary Tuberculosis.

This subject was dealt with fully in last year's report.

During the year under review, there were reported a grand total of 1,367 cases, of which 380 were extra-urban, 9 port, and 978 town cases, as against 918 town cases in 1930.

Total number of deaths	648
Death-rate per 1,000 of population	2·22
Case-rate per 1,000 of population exclusive of extra-urban cases ...	3·42
Death-rate per 1,000 of population exclusive of deaths of non-residents in hospitals	1·56

(30) *Phthisis, 1931.*

Number of Cases by Wards.

Ward.	Cases.
Fort	5
Pettah	16
San Sebastian	34
St. Paul's...	65
Kotahena	100
Mutwal	109
New Bazaar	94
Maradana North	57
Maradana South	47
Dematagoda	42
Slave Island	59
Kollupitiya	25
Cinnamon Gardens	9
Bambalapitiya	13
Timbirigasyaya	18
Wellawatta	24
Jails	1
Vagrants and Paupers	38
Untraced	222
Total ...	978
Port	9
Beyond Municipal Council limits	380
	1,367

(31) *Phthisis, 1931.*

Monthly Incidence.

Month.	Cases.	Month.	Cases.
January	96	September ...	101
February	77	October ...	72
March	77	November ...	79
April	65	December ...	77
May	56		
June	89	Total Town Cases ...	978
July	89		
August	100		

(32) *Phthisis, 1931.*

Number of Cases and Case-rates by Race.

	No. of Cases.	Case-rate per 1,000 Population.
All Races	978 ...	3·4
Europeans	8 ...	2·4
Burghers	44 ...	2·0
Sinhalese	543 ...	4·2
Tamils	196 ...	3·0
Moors	125 ...	2·8
Malays	33 ...	4·7
Others	29 ...	1·4

XV.—Enteric Fever.

(*a*)	Town cases	279
	Port cases	3
	Extra-urban cases	300
	Grand Total ...	582
(*b*)	Total number of deaths	171
	Death-rate per 1,000 population	0·60
	Death-rate per 1,000 population previous year (revised rate) ...	0·73
(*c*)	Total number of deaths, exclusive of deaths of non-residents ...	89
	Corrected death-rate per 1,000 population	0·31
	Corrected death-rate per 1,000 population previous year ...	0·41
	Further corrected by the addition of 26 deaths of Colombo residents at Infectious Diseases Hospital	0·40

(33) *Incidence of Enteric Fever by Wards, 1931.*

Wards.	No. of Cases 1930.	Case-rate per 1,000 Population, 1930.	No. of Cases 1931.	Case-rate per 1,000 Population, 1931.
Fort ...	1	0·62	—	—
Pettah ...	3	0·40	14	1·82
San Sebastian	7	0·54	8	0·60
St. Paul's	10	0·42	9	0·38
Kotahena	26	0·99	43	1·62
Mutwal	37	1·46	29	1·13
New Bazaar	32	1·24	20	0·76
Maradana North	50	1·90	19	0·69
Maradana South	19	1·15	14	0·84
Dematagoda	42	1·68	38	1·50
Slave Island	15	0·61	13	0·52
Kollupitiya	11	0·63	6	0·35
Cinnamon Gardens	8	0·92	3	0·34
Bambalapitiya	12	1·17	2	0·20
Timbirigasyaya	7	0·67	14	1·31
Wellawatta	19	1·10	9	0·52
Jails ...	25	—	4	—
Vagrants and Untraced	49	—	34	—
Total Town Cases ...	373	1·33	279	0·98

Enteric fever showed a marked decrease, there being 279 cases, as against 373 in the previous year. The death-rate was 0·60, as against 0·73 per 1,000 population in 1930. In the Pettah, Kotahena, and Timbirigasyaya wards there was an increase and in the Maradana, New Bazaar, and Wellawatta wards a decrease in the number of cases, as compared with the figures for 1930.

XVI.—Continued Fever.

There were 149 cases and 48 deaths during the year, of which the town cases numbered 103 with 39 deaths, as against 137 cases and 65 deaths in the previous year.

(34) *Number of Cases by Wards.*

Ward.	No. of Cases.	Ward.	No. of Cases.
Fort ...	—	Bambalapitiya ...	3
Pettah ...	1	Timbirigasyaya ...	1
San Sebastian ...	4	Wellawatta ...	2
St. Paul's ...	7	Jails ...	2
Kotahena ...	15	Vagrants and Paupers	1
Mutwal ...	18	Untraced ...	8
New Bazaar ...	17		
Maradana North ...	8	Total Town Cases ...	103
Maradana South ...	3	Port ...	2
Dematagoda ...	5	Outside limits ...	44
Slave Island ...	7		
Kollupitiya ...	1	Grand Total ...	149
Cinnamon Gardens ...	—		

XVII.—Dysentery.

There were reported 366 cases, of which 2 were port cases, 131 extra-urban cases, and 233 town cases, as against 411 town cases in previous year.

Of the 233 town cases, 36 were reported as amœbic, 47 bacillary, and the rest not specified.

(*a*) *Total Number of Deaths in City.*

Amœbic ...	...	13
Bacillary ...	...	32
Not specified ...	...	55
		100 = 0·35 per 1,000 Population.

(*b*) *Number of Deaths exclusive of Deaths of Non-residents in Hospitals.*

Amœbic ...	...	7
Bacillary ...	...	21
Not specified ...	...	31
		59 = 0·21 per 1,000 Population.

(*c*) *Case Mortality.*

Amœbic ...	...	...	... 19·4 per cent.
Bacillary ...	...	...	... 44·7 per cent.
Not specified	...	...	... 20·7 per cent.

(35) *Number of Cases by Wards.*

Ward.	No. of Cases.	Ward.	No. of Cases.
Fort ...	1	Bambalapitiya ...	2
Pettah ...	4	Timbirigasyaya ...	7
San Sebastian ...	6	Wellawatta ...	6
St. Paul's ...	15	Jails ...	16
Kotahena ...	10	Vagrants and Untraced ...	75
Mutwal... ...	21		
New Bazaar ...	9	Total ...	233
Maradana North ...	14	Port ...	2
Maradana South ...	9	Beyond Municipal Council limit ...	131
Dematagoda ...	18		
Slave Island ...	14	Grand Total ...	366
Kollupitiya ...	5		
Cinnamon Gardens ...	1		

(36) *Monthly Incidence.*

Month.	No. of Cases.	Month.	No. of Cases.
January ...	15	September ...	32
February ...	9	October ...	24
March ...	17	November ...	23
April ...	5	December ...	20
May ...	12		
June ...	9	Total ...	233
July ...	34		
August ...	33		

XVIII.—Diarrhœa and Enteritis.

Not being notifiable, the number of cases cannot be given.

The total number of deaths reported was 531, representing a death-rate of 1·86 per 1,000, as against 3·01 in 1930.

The number of deaths exclusive of deaths of non-residents in hospitals was 446, representing a death-rate of 1·56, as against 2·47, the corrected rate for 1930. Of the 446 deaths, 168 were of children under 2 years of age.

XIX.—Pneumonia.

Pneumonia was declared a notifiable disease on June 1, 1931, and 536 town cases were registered during the six months June to December. Of these, 158 cases were reported as broncho-pneumonia and 135 as lobar-pneumonia.

The total number of deaths from pneumonia was 895, as against 925 in 1930, and the rate per 1,000 population was 3·13, as against the revised rate of 3·29 for 1930. The rate corrected for non-residents in hospitals was 2·39, as compared with 2·57 for 1930.

(37) *Peumonia, 1931.* (*June 1 to December.*)

Number of Cases by Wards.

Ward.	No. of Cases.	Ward.	No. of Cases.	Ward.	No. of Cases.
Fort ...	—	Dematagoda ...	30	Untraced	120
Pettah ...	14	Slave Island ...	43		
San Sebastian ...	27	Kollupitiya ...	23	Total Town Cases ...	536
St. Paul's ...	34	Cinnamon Gardens ...	3	Port ...	2
Kotahena ...	26	Bambalapitiya ...	7	Beyond Municipal Council limits ...	234
Mutwal ...	36	Timbirigasyaya ...	7		
New Bazaar ...	61	Wellawatta ...	9		
Maradana North ...	46	Jails	8	Grand Total ...	772
Maradana South ...	29	Vagrants and Paupers ..	13		

(38) *Pneumonia, 1931 Monthly Deaths.*

Month.	Total Number of Deaths.	Number of Deaths exclusive of Deaths of Non-residents in Hospitals.	Month.	Total Number of Deaths.	Number of Deaths exclusive of Deaths of Non-residents in Hospitals.
January ...	71	55	September ...	59	41
February ...	61	43	October ...	65	50
March ...	47	40	November ...	43	32
April ...	74	56	December ...	64	46
May ...	83	57			
June ...	164	125	Total ...	895	684
July ...	84	69			
August ...	83	70			

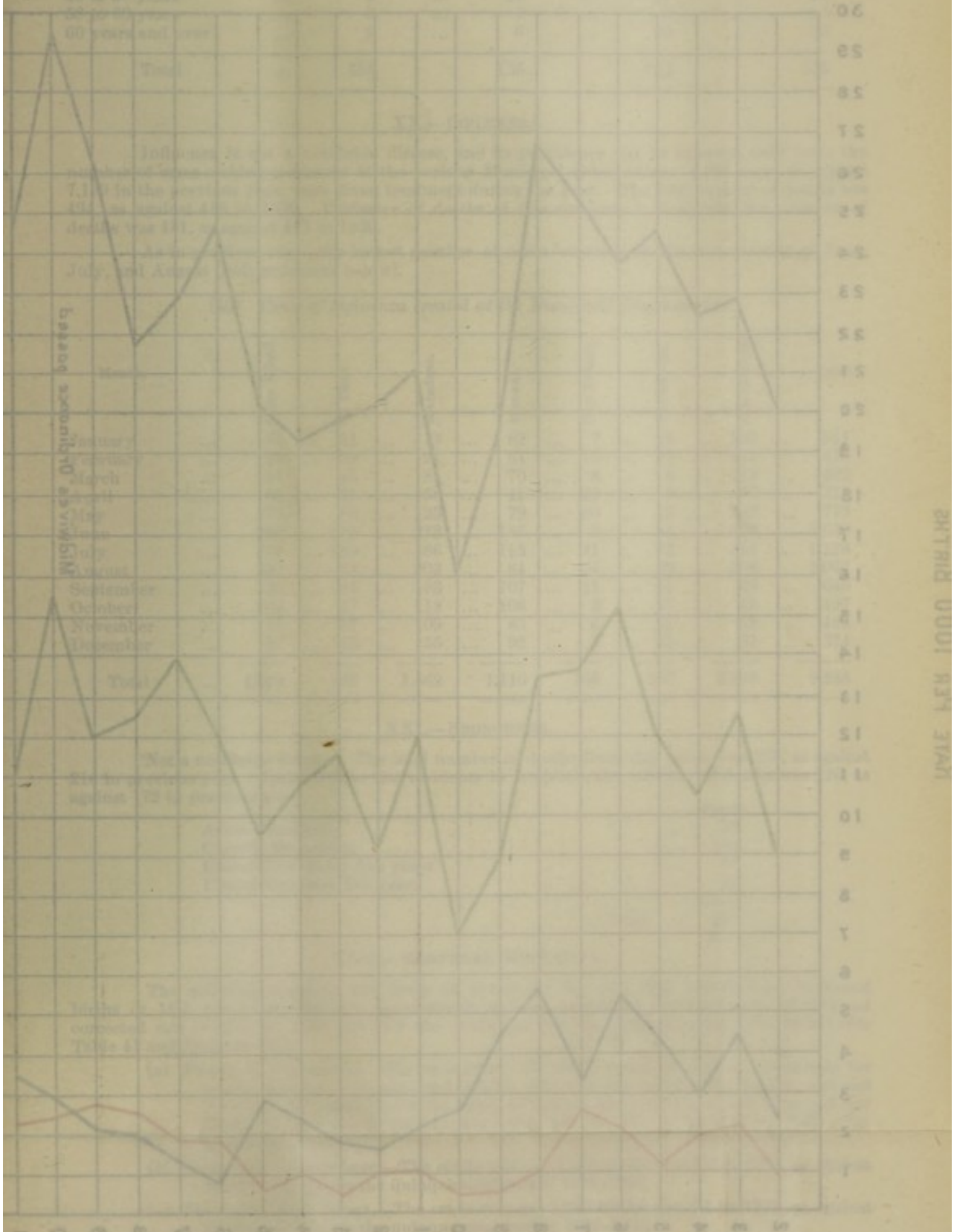
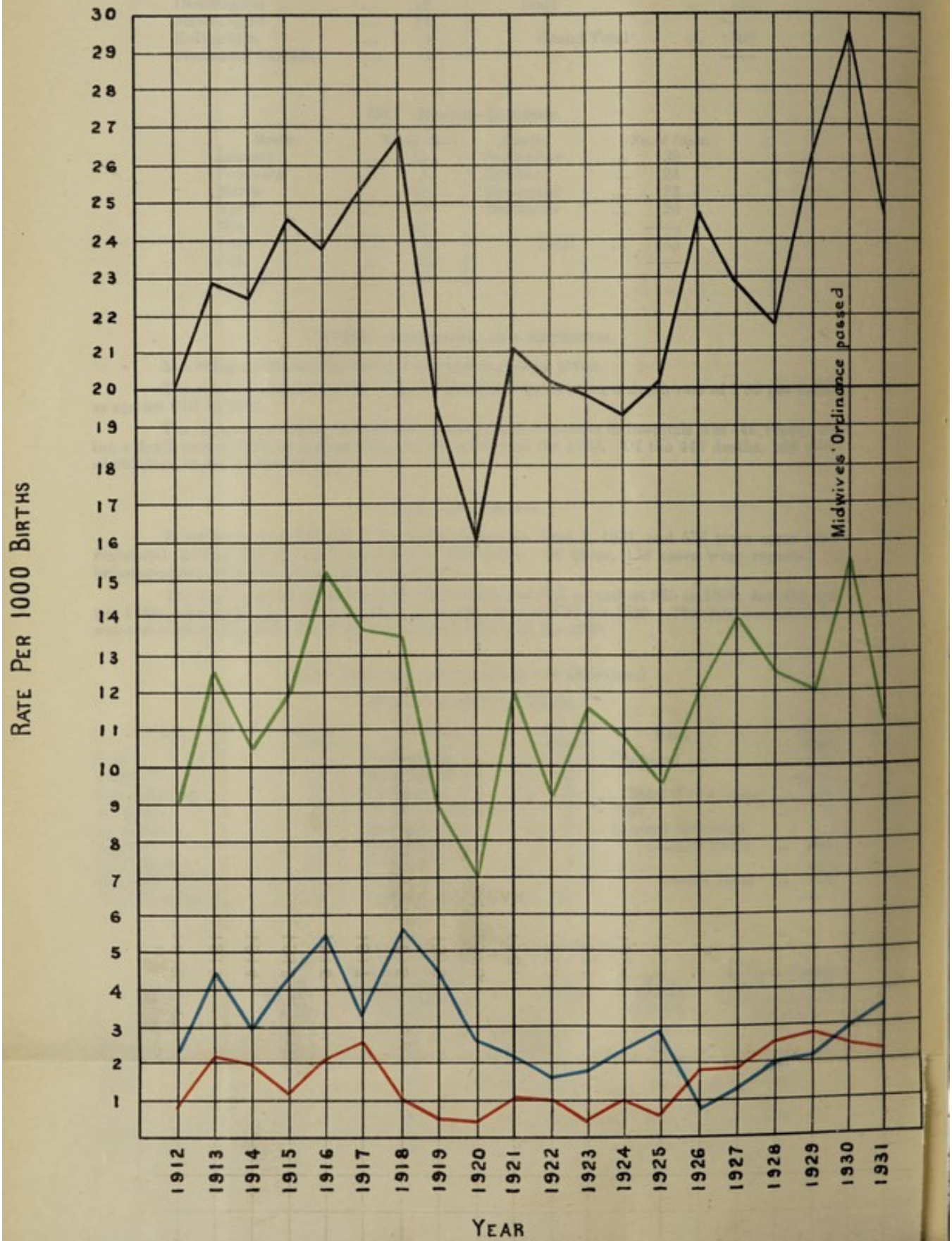


DIAGRAM III

MATERNAL MORTALITY 1912 - 1931

(Rate Per 1000 Births)

Black Line All Causes
Green Line Puerperal Septicaemia
Blue Line Puerperal Convulsions
Red Line Puerperal Haemorrhage



(39) *Pneumonia Cases (June to December, 1931.)*

Distribution According to Age.

Age Period.	Broncho-Pneumonia.	Lobar-Pneumonia.	Not Specified.	Total.
0 to 5 years	113	25	92	230
5 to 10 years	14	4	17	35
10 to 15 years	3	5	11	19
15 to 20 years	3	13	9	25
20 to 25 years	5	23	23	51
25 to 30 years	1	15	22	38
30 to 40 years	5	29	24	58
40 to 50 years	2	11	17	30
50 to 60 years	3	4	8	15
60 years and over	9	6	20	35
Total	158	135	243	536

XX.—Influenza.

Influenza is not a notifiable disease, and its prevalence can be inferred only from the number of cases seeking treatment at the various Municipal dispensaries. 8,288 cases, as against 7,199 in the previous year, were given treatment during the year. The total number of deaths was 494, as against 418 in 1930. Exclusive of deaths of non-residents in hospitals, the number of deaths was 481, as against 415 in 1930.

As in previous years, the largest number of cases occurred in the wet months of June, July, and August (*vide* statement below).

(40) *Cases of Influenza treated at the Municipal Dispensaries.*

Month.	Slave Island.	St. Pauls.	Maradana.	Mutwal.	New Bazaar.	Wellawatta.	San Sebastian.	Total.
January	94	54	73	82	7	19	182	511
February	52	59	91	61	13	23	177	476
March	91	45	81	70	8	8	119	422
April	82	29	58	41	22	6	77	315
May	170	88	123	79	20	17	282	779
June	249	220	372	186	2	81	529	1,639
July	219	180	186	115	41	43	344	1,128
August	337	68	203	84	24	59	302	1,077
September	130	95	193	107	11	41	69	646
October	106	47	118	108	2	47	69	497
November	74	67	109	85	6	21	62	424
December	87	43	55	92	9	31	57	374
Total	1,691	995	1,662	1,110	165	396	2,269	8,288

XXI.—Bronchitis.

Not a notifiable disease. The total number of deaths from this cause was 256, as against 216 in previous year. Corrected for non residents in hospitals, the number of deaths was 226, as against 172 in previous year.

	Deaths.
Acute Bronchitis	59
Chronic Bronchitis	102
Unspecified under five years	73
Unspecified over five years	22
Total	256

XXII.—Maternal Mortality.

The maternal mortality rate from all causes for the year 1931 was 24·8 per thousand births or 18·5 when corrected for non-resident mothers, as against the crude rate of 29·0 and corrected rate of 23·7 for 1930 and 24·9 the crude rate for the quinquennium 1926–1930 (*vide* Table 41 and Diagram III.).

(*a*) *Puerperal Septicæmia.*—The rate from this cause, which used to be responsible for nearly half the total maternal deaths, was 11·0 per 1,000 births (crude rate) and 8·3 per 1,000 births (corrected rate), as against 15·6 crude and 13·6 corrected for 1930 and 13·2 per 1,000, average crude rate for the quinquennium 1926–1930 (*vide* Table 41).

(*b*) *Puerperal Hæmorrhage.*—The crude rate per 1,000 births was 2·3 in 1931, as against 2·2 the average for the quinquennial period 1926–1930.

(*c*) *Puerperal Convulsions.*—The crude rate per 1,000 births was 3·4 in 1931, as against 1·7 the average for the quinquennial period 1926–1930.

Whereas there was a drop in the rate from all causes (*vide* Diagram III.) mainly due to the fall in septicæmia rate; the rate from puerperal convulsions has been on the rise since 1926 (*vide* Diagram III.).

It is not possible to say so soon what is the reason for the drop in the septicæmia rate, whether or not it has anything to do with the enactment of the Midwives' Ordinance in 1930, but it is significant that, with the elimination of a large number of unqualified, untrained women who were practising as midwives in the city, the death-rate from puerperal septicæmia should go down. Undoubtedly, the high septicæmia rate is mainly due to "dirty midwifery" by private midwives and also to infection soon after delivery in the dirty homes of the patients.

(41) *Maternal Mortality, Rate per 1,000 Births.*

Year.	Puerperal Septicæmia.	Corrected Rate.	Puerperal Hæmorrhage.	Puerperal Convulsions.	All Causes.	Corrected Rate.
1912 ...	9·0	—	0·6	2·3	20·0	—
1913 ...	12·5	—	2·1	4·4	22·8	—
1914 ...	10·5	—	1·9	2·9	22·4	—
1915 ...	11·9	—	1·2	4·3	24·6	—
1916 ...	15·3	—	2·2	5·4	23·8	—
1917 ...	13·6	—	2·6	3·2	25·4	—
1918 ...	13·5	—	1·0	5·6	26·7	—
1919 ...	8·8	—	0·5	4·4	19·1	—
1920 ...	7·0	—	0·4	2·5	15·7	—
Average, 1916–1920 ...	11·6	—	1·3	4·2	22·1	—
1921 ...	12·0	—	1·0	2·1	21·1	—
1922 ...	9·2	—	0·9	1·6	20·2	—
1923 ...	11·5	—	0·4	1·7	19·8	—
1924 ..	10·7	—	1·0	2·3	19·3	—
1925 ...	9·5	—	0·6	2·8	20·2	—
Average, 1921–1925 ...	10·6	—	0·8	2·1	20·1	—
1926 ...	12·1	—	1·7	0·7	24·7	—
1927 ...	13·9	—	1·8	1·2	22·8	—
1928 ...	12·5	—	2·5	1·9	21·8	—
1929 ...	12·0	10·6	2·7	2·1	26·3	21·0
1930 ...	15·6	13·6	2·4	2·8	29·0	23·7
Average, 1926–1930 ...	13·2	—	2·2	1·7	24·9	—
1931 ...	11·0	8·3	2·3	3·4	24·8	18·5

Part II.—Administration.

XXIII.—Maternity and Child Welfare.

The report of the Medical Officer, Maternity and Child Welfare, which is appended, shows considerable progress made during the year. The work is now well organized and carried on smoothly. The staff consists of 1 whole-time Medical Officer, 1 Superintendent of Health Nurses, 21 Health Nurses, and 16 Midwives. (See Photograph I). Map I. shows the town divided into a number of nurses' divisions; the uncoloured parts of the town represent the commercial areas (Fort and Pettah wards) and the better class residential areas (Cinnamon Gardens, Kollupitiya, Bambalapitiya, and Timbirigasyaya wards) which are not "worked" by the nurses. The same map shows the three Municipal Welfare centres (red dots) and three Municipal dispensaries (black dots) which are utilized for the purpose of holding ante-natal clinics, as centres have not been built in these wards as yet.

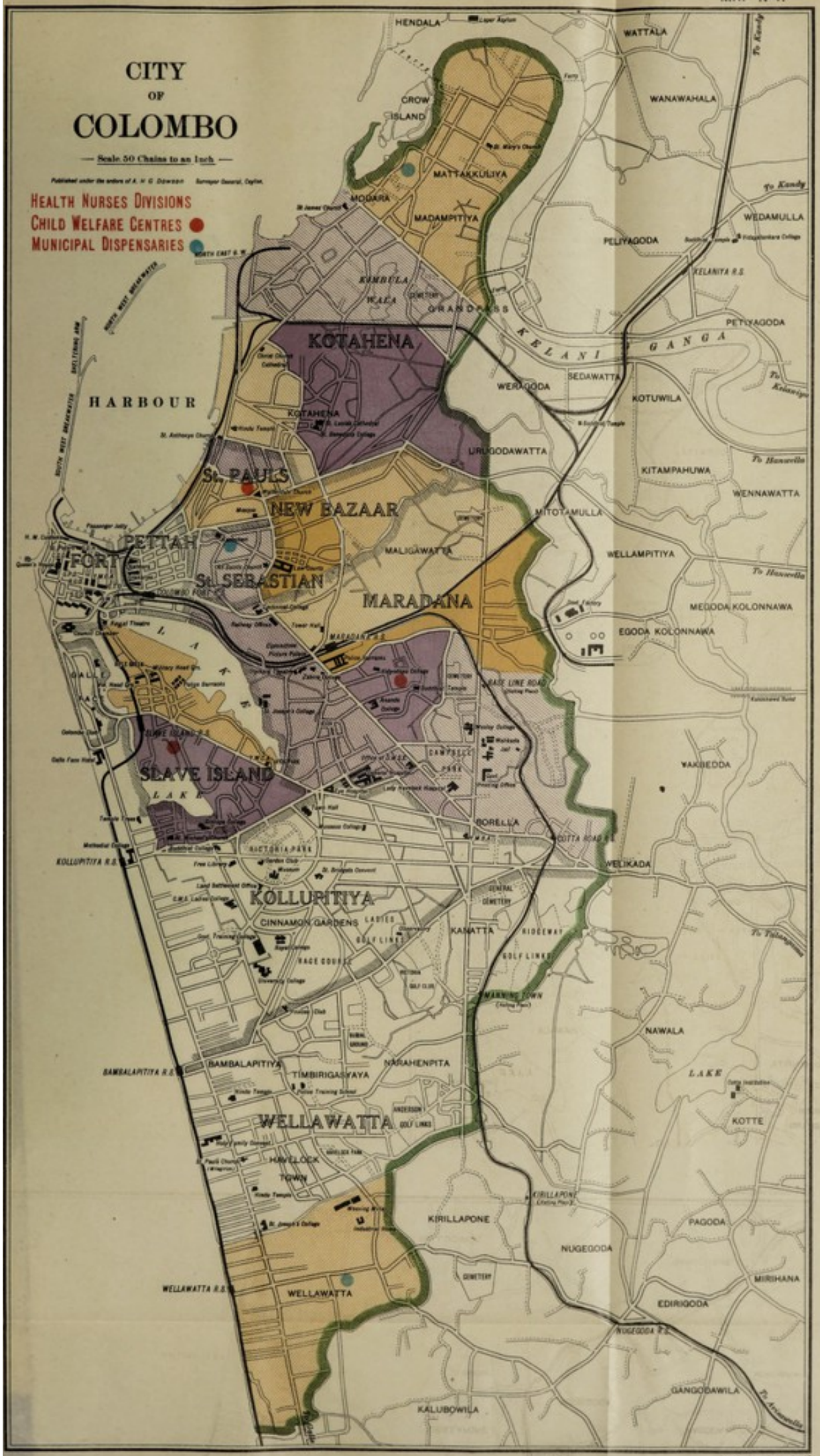
Of the three centres, the St. Paul's and Slave Island ones have been specially designed and built for the purpose and are in every respect excellent institutions (*vide* Photographs II. and V.). The Maradana centre was the old Health office. By internal alterations it has been adapted for the purpose of a centre.

Photographs VIII. and IX. show the Municipal dispensaries at Mutwal and San Sebastian. They are rented buildings and are neither commodious nor suitable for the purpose of either an Outdoor dispensary or Infant Welfare centre, but until such time as Council can build its own institutions in these wards, it will be necessary to put up with the difficulties and inconveniences arising from inadequate accommodation and unsuitable structural arrangements. Map II. shows the various Municipal and private centres from which free milk is distributed to poor mothers. Dried milk powder (Lactogen and Sunshine Glaxo) is given at the Municipal centres, as the practical difficulties of giving fresh cow's milk, however desirable, were found to be very great. Table 42 shows amount expended on milk since 1925. Photograph VI. shows women waiting to get their daily supplies of milk powder from the Slave Island centre.

(42) *Annual Expenditure on Free Milk, 1925–1931.*

Year.	Total Cost. Rs.	c.
1925	1,176	90
1926	5,190	90
1927	6,026	20
1928	5,017	0
1929	6,066	0
1930	6,066	0
1931	8,460	0

1. CHILD WELFARE STAFF.



Survey Dept. Ceylon. 3. 4. 12.

CITY
OF
COLOMBO
HARBOUR
MARADANA
KOLLUPITIYA
WELLAWATTA

CITY OF COLOMBO

— Scale 50 Chains to an Inch —

* Published under the orders of A. H. G. Dawson Surveyor General, Ceylon.

FREE MILK DISTRIBUTING CENTRES.

MUNICIPAL.....

SOCIAL SERVICE LEAGUE..

CHILD WELFARE ASSOCIATION'S CRÈCHE

Survey Dept. Ceylon. 5. 11. 30.

CITY OF COLOMBO

FREE MILK DISTRIBUTING CENTRES

KOTAHENA

HARBOUR

NEW BAZAAR

ST. SEBASTIAN

MARADANA

SLAVE ISLAND

KOLLUPITIYA

WELLAWATTA

MUNICIPAL

SOCIAL SERVICE LEAGUE

CHILD WELFARE ASSOCIATION'S CRÈCHE

In order to obviate any ill-effects from feeding infants on dried milk powder, cod liver oil emulsion is issued to the mothers to be given to the children. The children thrive well on these foods and would do still better if it were financially possible to give the mothers the full quantity of food needed for the day ; but as funds do not permit only one or two, or rarely, in very needy cases, milk for more than two feeds are given. The result is mothers give other unsuitable foods for the other feeds and upset the stomachs of the little ones and retard the progress of the child. Photographs X. and XI. show a very bad case of a prematurely born twin infant, named Lena, which weighed only 2 pounds 14½ ounces when she was brought to the centre and put on artificial feeding. Diagram VI. shows the excellent progress she made under proper advice and feeding.

The attendance at all centres is very good and the attendance especially of Muslim women is most encouraging indeed, showing confidence in the doctor and an appreciation of the value and benefit of ante-natal care. Photograph III. shows a clinic day at St. Paul's centre—in the front of the picture expectant mothers waiting to go in to see the doctor and be examined, and at the back of the picture (Photograph III.) babies being weighed and their weights recorded by the nurses on duty. At St. Paul's centre, a sewing class has also been started for mothers (Photograph IV.) where simple sewing of children's garments, &c., are taught them, and also talks on mother-craft are given by the Superintending Public Health Nurse. To the Misses J. and E. Ferdinando, who are kindly helping at these sewing classes, my grateful thanks are offered.

Diagram IV. is a bar graph showing the proportionate number of (*a*) births in the hospitals, (*b*) the number conducted by the Municipal midwives in the homes of the people, and (*c*) the number of births in the city conducted by private midwives.

Diagram V. shows in the form of a graph the number of labour cases conducted by the Municipal midwives and the rise in the number after the appointment of the Medical Officer and the establishment of the centres is remarkable. The average number of cases is eleven per mensem. Considering the very large proportion of cases still attended to by private midwives or at the Lying-in Home—the accommodation of which is greatly taxed—the Municipal midwives should do not less than 30 cases a month each. At the three centres, midwives are on duty day and night and are sent out immediately by the resident Health Nurse on receipt of a summons, but in those wards where there are no centres, people have to go to the homes of the midwives and get them. In such cases, there is reason to believe that midwives sometimes pretend they are out on another case or are not prompt in responding to the summons. The only way to obviate this is to have more centres from which midwives could be despatched on receipt of a call.

Conclusion.—From a study of the facts and figures given under Section VI. dealing with Infant and Maternal Mortality, it will be seen that the money spent by Council in Child Welfare work, which of course includes the care of the mother, has been well invested and the work done so far has yielded good and encouraging results. A great deal of the mortality of infants is absolutely preventable and the wonderful results already obtained in New Zealand, Australia, Canada, England, &c., where Child Welfare work has been steadily and intensively carried on, encourages the confident belief that in Ceylon too we may bring our rate down, if not to the same extent as in these countries, to a much lower level. Infant mortality represents not only the actual number of lives lost but also a great deal of sickness and mortality in early childhood and mental and physical defectiveness in later years in those who survive. For every infant killed many are damaged for life, and in preventing deaths we also prevent the damage. Physique, vigour, and mental efficiency are highest in those countries where the infant mortality rate is the lowest, and, if the future citizens of this land are to be "steady, strong and strenuous" we must watch the growth and safeguard the interests of the child from the moment of conception. Logically we must even go beyond this point. The child has no voice in the selection of its parents and even today we frequently see, even among the educated class, the sad spectacle of marriages being arranged for such sordid considerations as caste and cash between individuals wholly unfit from the point of view of health or physical and mental efficiency, to be the ancestors of a vigorous race. What is the result of these pernicious customs ? We continue to cast upon this unhappy world mentally defective and physically weak children without stamina to combat disease or the strength and vigour to lead the full and efficient life. When we are so particular about the pedigree of our cows and dogs and poultry, it should surely be the sacred and serious duty of the future fathers and mothers to so choose each other deliberately that between themselves they would ensure to their offspring a sound and healthy ancestry, and leave them a legacy of a sound mind in a sound body. "A man's destiny stands not in the future but in the past."

From the moment of conception to the time of birth, the father leaves the stage and the mother plays the principal rôle and all the factors that influence her, whether for good or ill, affect the child within her, and it is during this period that we can come in and see that every expectant mother has proper ante-natal advice and care and provide, for those mothers who through adverse circumstances cannot provide for themselves, adequate food and proper rest. We have seen in the section dealing with infant and maternal mortality the great wastage of (*a*) infant lives from malnutrition, premature birth, &c., due to insufficient food and want of rest, (*b*) maternal lives from puerperal convulsions, hæmorrhage, &c., due to want of ante-natal care.

At birth both mother and child need skilled attention and care. The maternal deaths from puerperal hæmorrhage and septicæmia are due to lack of such attention and care and the infant deaths from convulsions and injuries are also due to the same cause.

After birth the mother and child need proper care and attention—the infant for a longer time than the mother—the mother for treatment of injuries received and perhaps overlooked at time of birth and to prevent infection during the puerperium. The large number of maternal deaths from puerperal septicæmia is due, as we have seen, to dirty midwives, dirty homes, dirty linen, and dirty hands, and sometimes to a septic focus such as pyorrhœa in the mother. Pyorrhœa is a very common condition seen at the ante-natal clinics, and it has been shown that even in the labour cases conducted with scrupulous care as to asepsis, puerperal septicæmia is not unknown, and in such cases pyorrhœa has been believed to be responsible.

The human infant, unlike the young of the lower animals, is utterly helpless and needs post-natal care and attention for the whole of the first year of its life and longer. We have seen in Table 20, that by far the largest number of deaths occur in the first two months of its life from causes which are wholly or partially preventable. In the later months of its life, its greatest danger is from wrong feeding. The breast-fed infant has a far better chance of surviving than the artificially fed one and the chief reason for artificial feeding, among the poorer classes, is poverty which deprives the mother of adequate nourishment for herself and drives her to work away from the home. If we can ensure to the nursing mother sufficient food and keep her from outside work, many hundreds of infant lives could be saved every year. Ignorance, carelessness, and dirty habits are also responsible for many deaths. After the child is weaned, the mother must know what food is suitable, how to prepare it, and how to keep it clean and free from infection. Education in mother-craft, clean habits, and intelligence are needed to know what to do and how to carry out the instructions given.

Suggestions for future.—The Medical Officer, Maternity and Child Welfare, is also Inspector of Midwives. His time is so fully occupied at the various centres that it leaves him very little or no time for the proper inspection of the work of the large number of private midwives practising in the city. The attendance at the centres is increasing, and sooner or later for this work alone a medical assistant will be necessary. The work of the private midwives needs very frequent inspection and tighter control, if the high maternal death-rate from preventable causes such as puerperal septicæmia and puerperal hæmorrhage is to be reduced.

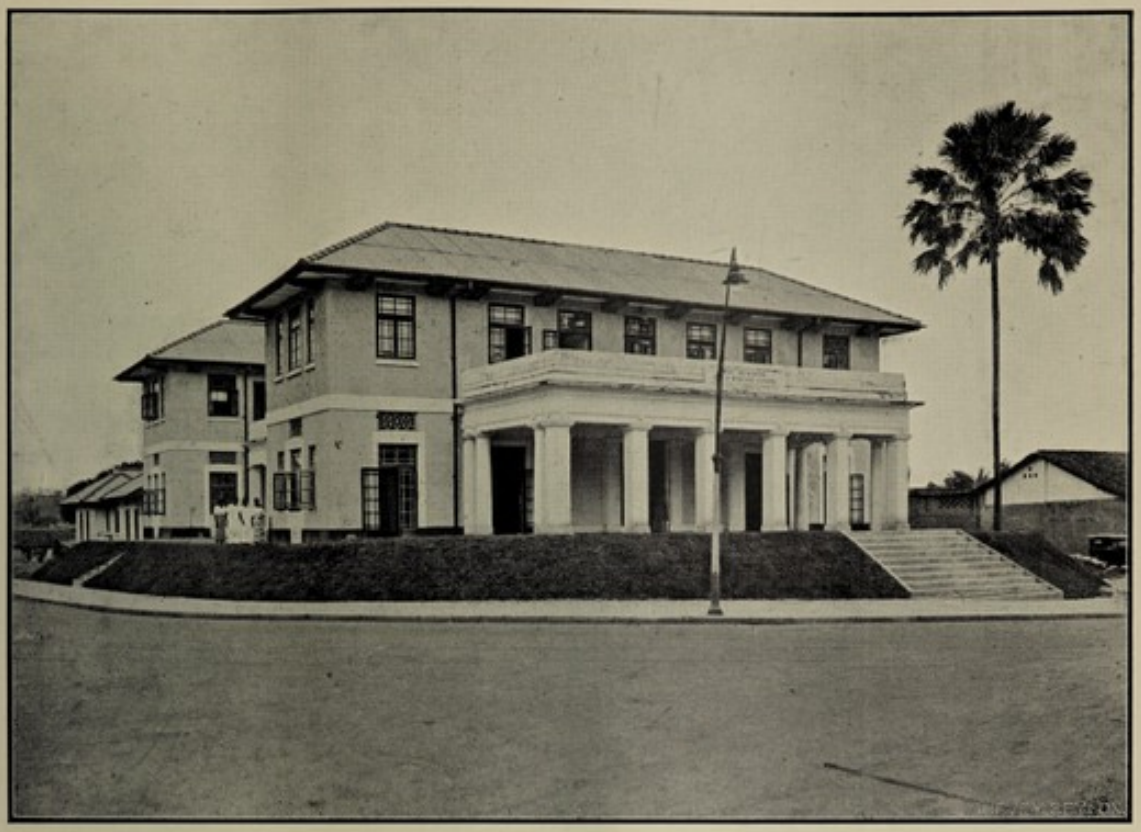
With the present staff of nurses, it is just possible to keep infants under observation for one year only. We can do practically nothing with older children as the nurses already have long lists to visit. Children between 1 to 5 years also need visiting to see that they are being properly fed, &c. A few more nurses would enable us to extend home visiting for more than one year. The staff of midwives is sufficient for the present. As a matter of fact, they can do more work, and negotiations are now on foot between the Department of Medical and Sanitary Services and the Council for the Municipal midwifery service to take on some of the normal cases that are now admitted into the Lying-in Home where the accommodation is severely taxed. The St. Paul's centre (*vide* Map I.) serves at present a very large area, namely, St. Paul's, San Sebastian, New Bazaar, and Kotahena wards. People from parts of New Bazaar and Kotahena find it difficult to walk so far to the centre either for a midwife or daily for their children's milk rations. We need a centre at the eastern end of New Bazaar ward. This would also serve a large part of Kotahena. A site has been purchased at Urugodawatta road for a Municipal market, and there is, I believe, sufficient room for the erection of a Municipal dispensary and Child Welfare centre.

Mutwal ward is now worked from the Municipal dispensary ; this is unsatisfactory, and we need a properly equipped centre, as this is one of the poorest wards and there is great scope for Welfare work. An old house which Council owns at Rajamalwatta is now being renovated to house the Municipal dispensary which at present is in rented quarters. This house is more commodious than the present Mutwal dispensary, and Child Welfare work could be carried on here with less discomfort, but there is not enough accommodation for a resident Health Nurse and midwives. The grounds attached to this house are sufficiently large for the erection some day of a centre on the lines of the one at Slave Island. When funds permit, the construction of a proper centre should be considered.

Council spends on an average about Rs. 12,000 on feeding, &c. This sum is mainly spent on milk for deserving infants. Even with this amount it is not possible to give every deserving child the full number of feeds for the day. If more funds were available, milk powder for more feeds could be given. It is all very well to advise mothers to breast-feed their children, but with all the will in the world, many of them cannot do it owing to their own wretched physical condition. What most of them need is at least one good, simple, wholesome meal for the day. If this could be given, many of them would be able to continue breast-feeding much longer with incalculable benefit to the child. After all, there is nothing like mother's milk, mother's care, and mother's love for a child.

The high maternal mortality rate from puerperal septicæmia could be controlled better, if small maternity homes were available in the poor and congested districts of the city. Aseptic midwifery is out of the question in the dirty and wretched dwellings of the poor, and many lives are lost owing to the filthy conditions under which parturition takes place. In a single or two-roomed tenement there is no space, privacy, or conveniences such as proper light, ventilation, bed, linen, or even sufficient water to conduct a case properly, and a couple of days after the labour is over, many poor women have to get up and attend to their household duties and other young children. The accommodation at the Lying-in Home is inadequate, and it is the only maternity hospital in the city. A hospital should of course be primarily for difficult and abnormal cases, and, if smaller maternity homes were available in other parts of the city, especially in Mutwal, New Bazaar, and San Sebastian wards, the hospital would not be so overcrowded, and normal cases could be delivered under clean conditions in these homes. The question of providing such homes should be seriously considered by the Council when the financial situation improves. The Child Welfare service would not be complete without such homes.

Another very great necessity for poor women is a suitable maternity outfit. The high percentage of loss of life due to sepsis could be materially reduced if funds were available for providing free accouchement outfits to poor women who now use the oldest and dirtiest rags in the house.



2. C. W. CENTRE—ST. PAUL'S WARD—OPENED 1.5.28.

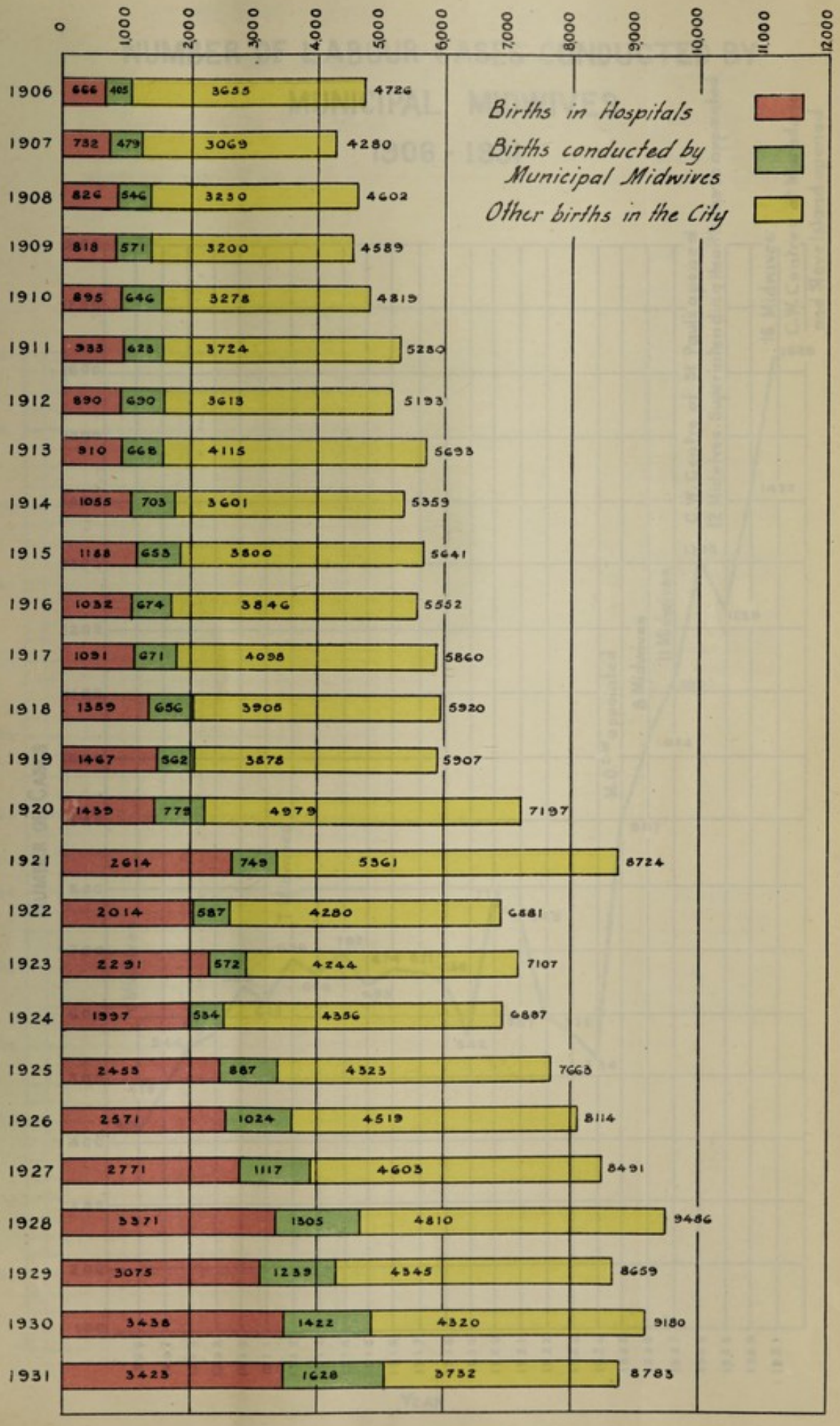
3. C. W. CENTRE—SLAVE ISLAND—OPENED 7.7.31.

4. MUNICIPAL FREE DISPENSARY, MUTWAL.

5. MUNICIPAL FREE DISPENSARY, SAN SEBASTIAN.

BIRTHS

DIAGRAM IV



DIAGRAM

BIRTHS

DIAGRAM V

NUMBER OF LABOUR CASES CONDUCTED BY MUNICIPAL MIDWIVES 1906 - 1931

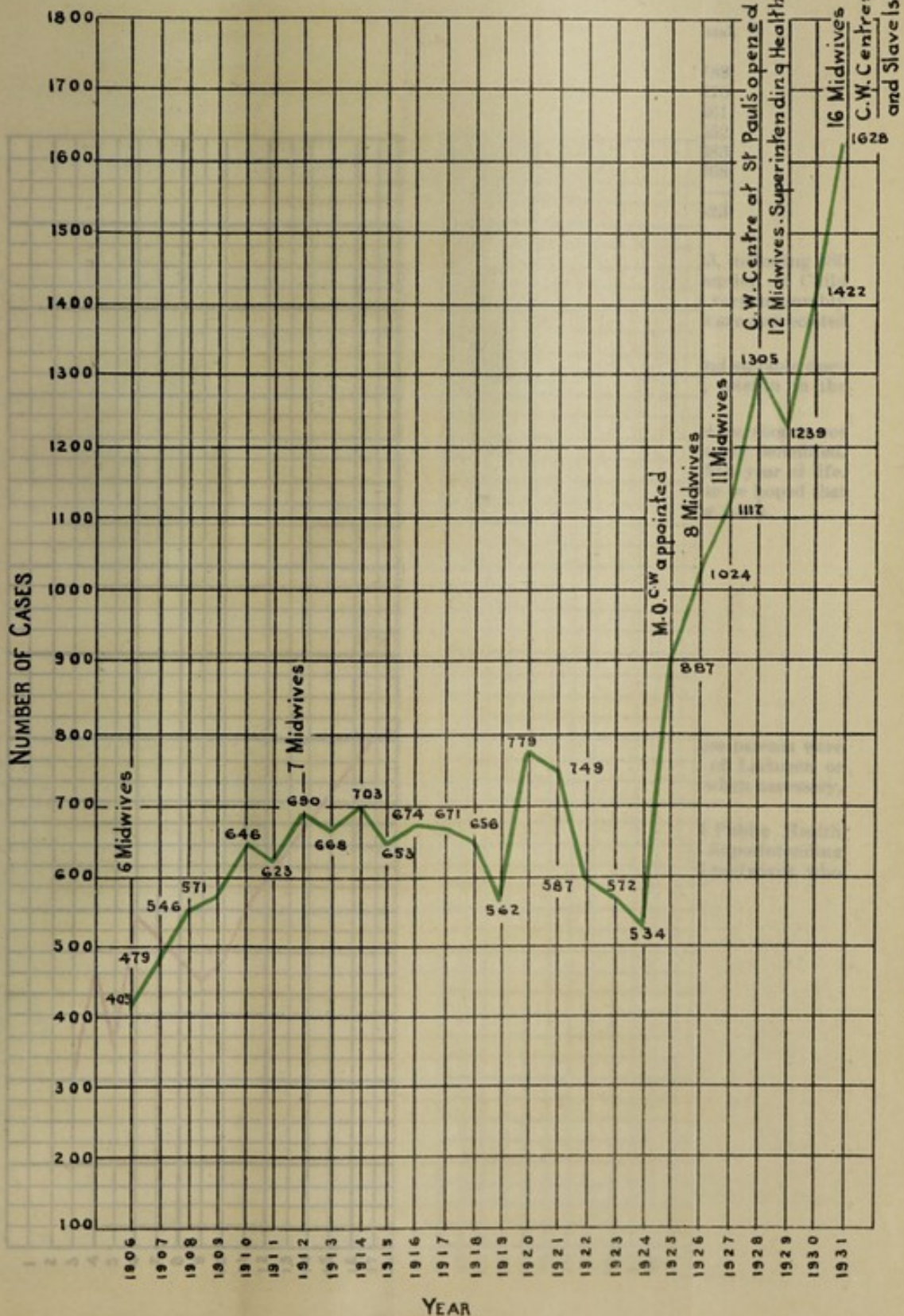


DIAGRAM V

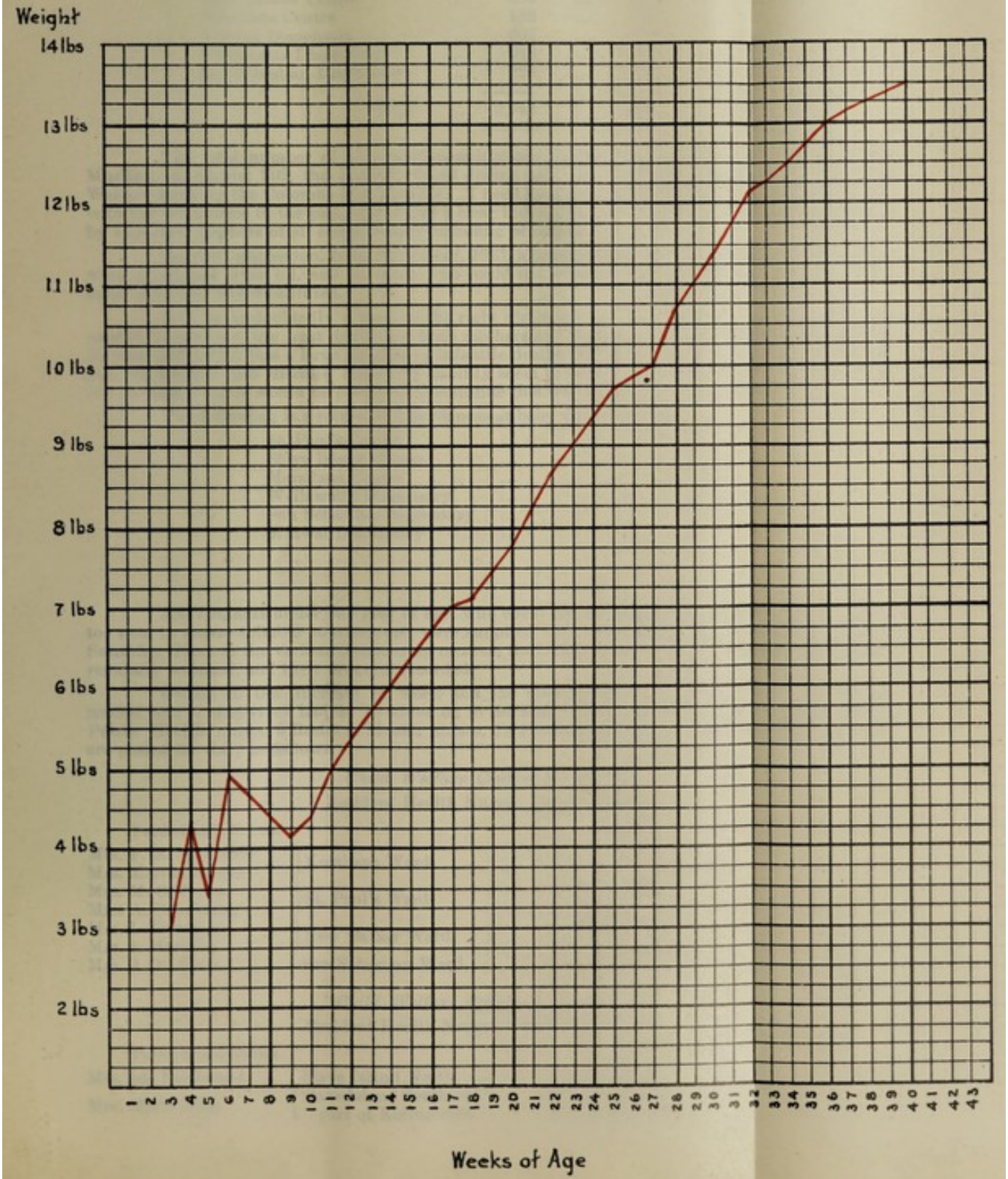
NUMBER OF LABOUR CASES CONDUCTED BY MUNICIPAL MIDWIVES 1906 - 1931

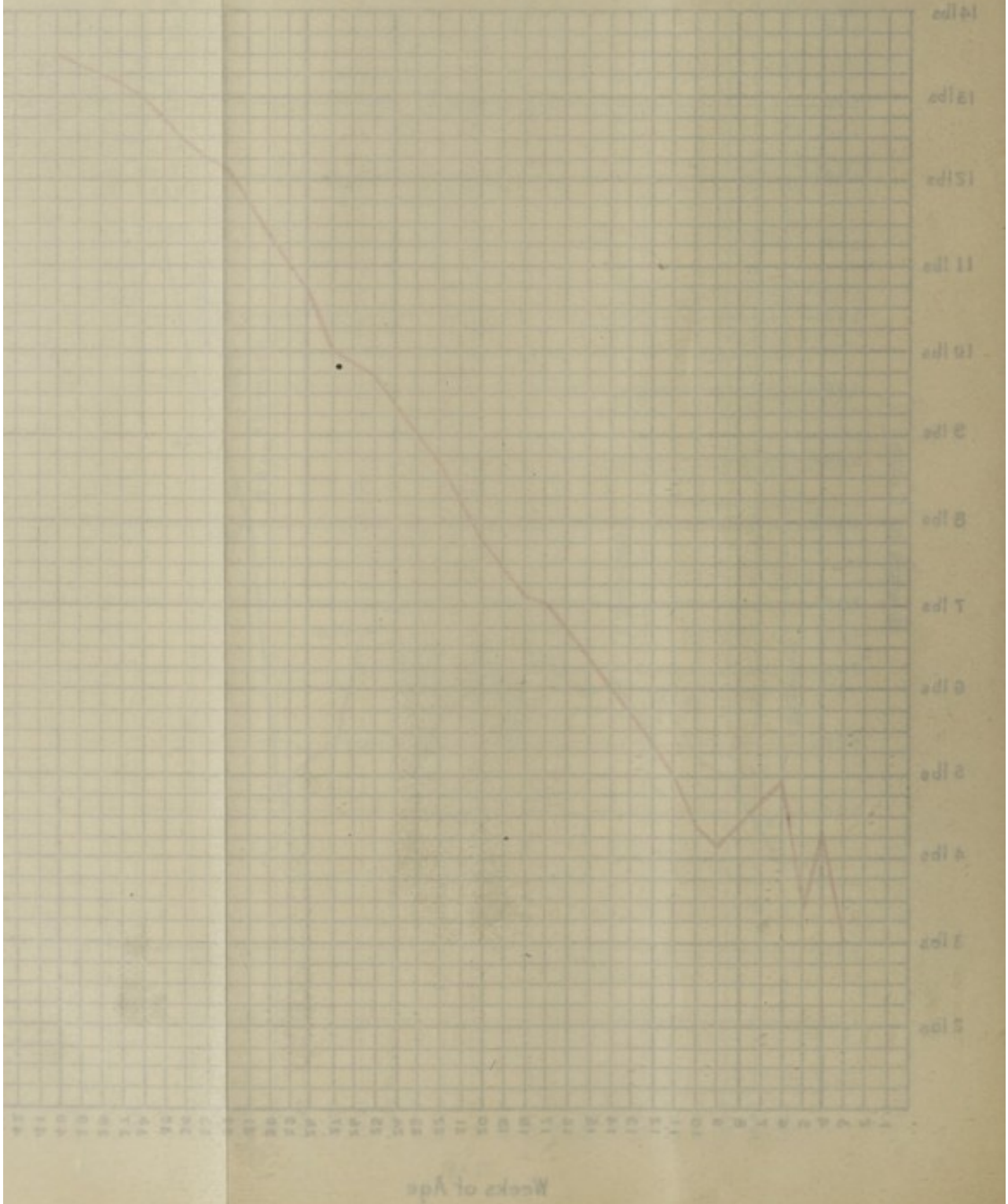
DIAGRAM VI

WEIGHT CHART OF BABY LENA

ONE OF PREMATURE TWINS

Born 8·4·31 Weight at 3rd week when feeding first started was 2 lbs 14½ oz: Weight at 10Ts Month 13 lbs·8 oz:





REPORT OF THE MEDICAL OFFICER, MATERNITY AND CHILD WELFARE, FOR 1931.

THE MEDICAL OFFICER OF HEALTH, COLOMBO.

I HAVE the honour to submit my report on Maternity and Child Welfare work of my branch during the year 1931.

Two new centres, Maradana and Slave Island, were opened in July; the former on the 1st, and we had the honour of having Lady Bourdillon to open the latter on the 7th.

Weekly ante-natal clinics were held at St. Paul's, Slave Island, and Maradana centres and at each of the Municipal dispensaries at San Sebastian, Mutwal, and Wellawatta. Here expectant mothers were examined and advised and treatment given when necessary.

The following is a return of the ante-natal attendance at the clinics.

Centre or Dispensary.	All Races except Muslims.	Muslims.	Total.
St. Paul's Centre ...	559	230	789
Slave Island Centre ...	531	239	770
Maradana Centre ...	482	179	661
Mutwal Dispensary ...	601	51	652
Wellawatta Dispensary ...	542	41	583
San Sebastian Dispensary ...	228	140	368
Total ...	2,943	880	3,823

The total number of ante-natal examinations during the year was 3,823, including 880 Muslims, as against 902, the highest record during any one year since the inception of Child Welfare work by the Colombo Municipality. I need hardly say that this compares very favourably with the work done in the past, and is also a clear indication that ante-natal clinics are appreciated by expectant mothers of all communities including Muslims.

On your suggestion, from November, 1931, a large number of expectant and suitable cases were given cod liver oil, and to those who could not stomach this preparation, ostellin in the form of tablets was substituted.

This is undoubtedly a step in the right direction, and, although it is yet too soon to see results, I have not the least doubt that both mothers and infants would be immensely benefitted. In view of the fact that a large number of infantile deaths take place during the first year of life, and, as debility and diseases caused by debility seem to be the main cause, it is to be hoped that the necessary funds would be provided to continue this treatment for at least a few years.

The following is a return of attendances at baby clinics for 1931.

St. Paul's Centre	476
Slave Island Centre	107
Maradana Centre	148
Wellawatta Dispensary	61
San Sebastian Dispensary	32
Mutwal Dispensary	28
	932

2,447 infants under one year of age, who could not be breast-fed and whose parents were too poor to secure suitable nourishment, were supplied with free milk in the form of Lactogen or Sunshine Glaxo at the various distributing centres; the infants were also examined when necessary, regularly weighed, and their progress recorded.

Owing to the increase of work and the opening up of 2 centres, 3 Public Health nurses, and 4 midwives had to be added on to the staff, which now consists of a Superintending Public Health nurse, 3 Resident Health nurses, 18 Public Health nurses, and 16 midwives who are posted for duty as follows.

Child Welfare Centre, St. Paul's.

Resident Health Nurse: Mrs. L. Earde.

Public Health Nurses.		Midwives attached.
Mrs. F. E. M. Harris Mrs. Martha Perera	Kotahena Ward.	N. Dharmaratne. J. A. M. P. Jayasinghe
Mrs. M. S. Perera Miss A. Schokman	St. Paul's Ward.	K. C. Perera. Inoon Jariya.
Mrs. I. Zieseness Mrs. I. Marsden	New Bazaar Ward.	P. Madeline Perera. W. A. Lilian Perera.
Mrs. A. E. Firth	San Sebastian Ward.	P. A. Lily Perera.

Child Welfare Centre, Slave Island.

Resident Health Nurse: Miss Bastian Pillai.

Public Health Nurses.		Midwives.
Mrs. Ida Ferdinand	Slave Island North.	Inche Juhary.
Mrs. Maud John	Slave Island South and part of Kollupitiya.	Maria R. Candappa. Martha Fernando.

Child Welfare Centre, Maradana.

Resident Health Nurse: Mrs. C. M. Poulier.

Public Health Nurses.		Midwives.
Mrs. M. M. Marshall Miss E. Jansen	Maradana North.	Emily Direcksz.
Mrs. E. R. V. de Bruin	Maradana South.	M. R. Sathasivam.
Mrs. M. M. Samarasekera Mrs. Muriel A. de Silva	Dematagoda.	Nona Suriyani.

Mutwal.

Public Health Nurses.		Midwife.
Mrs. A. Cruse	Mutwal North.	Angelina Fernando.
Mrs. V. Misso	Mutwal South.	

Wellawatta.

Public Health Nurse.	Midwife.
Mrs. Erin Meier	Roslyn Perera.

Relieving Public Health Nurses.	Relieving Midwife.
Mrs. Q. Mortimer (First Relief). Mrs. Erin Meier (Second Relief).	Beatrice Rajapakse.

The Public Health nurses are on duty daily (except Sundays and public holidays) and their duties are as follows:–

From 7·30 A.M. to 10 A.M. verify birth returns and visit babies and mothers.

From 10 A.M. to 11·30 A.M. a daily report is made of the routine done, in the office attached to the centres.

From 2 P.M. to 4 P.M. routine house to house visiting in the slums, the purpose of this being—

(1) To instruct the poor in health matters, *e.g.*, advantage of cleanliness, precautions to be taken when infectious diseases exist in the neighbourhood, &c.

(2) To advise the poor when illness prevails in their houses and persuade such to make use of the hospitals, dispensaries, and Child Welfare centres.

(3) To advise pregnant mothers whom they come across to attend the centre.

(4) To advise mothers to bring their children under one year of age, who require proper feeding, to the centre, and to help mothers to register their babies.

The Public Health nurses have paid in all 53,947 visits and their work has been satisfactory. I am glad to be able to bear testimony again to the excellent work done by the Superintending Public Health Nurse, Miss L. Wambeek, and the card system introduced by her last year is working very satisfactorily.

The midwives attached to the various centres give their services free to the poor and are available any time during the day or night. They have attended altogether 1,628 cases and their work has been satisfactory. On 85 occasions the patients of the midwives and Public Health nurses were visited and prescribed by me at their own homes.

Lectures are regularly given to the Public Health nurses and midwives at the Child Welfare centre, St. Paul's.

Re my duties as Supervisor of Midwives, I am glad to say that a large number of midwives were registered during the year, and many did so only after the receipt of a letter threatening prosecution. There are still a good many qualified but unregistered midwives, who plead poverty and inability to pay the registration fee at once. I have given them time and hope to get them registered before long. Midwives who have had no training whatever and who are not entitled to registration are being prosecuted, but there is a good deal of trouble in getting the necessary evidence for a successful prosecution. People who have had the services of an unqualified midwife are not only reluctant to come forward to give evidence against her, but even when they do, their evidence cannot be depended on.

Two midwives were prosecuted during the year, one an unqualified and unregistered midwife was severely warned and discharged by the Magistrate, the other a qualified and registered midwife who was prosecuted for neglect of duties was acquitted owing to the unsatisfactory nature of the evidence.

The Child Welfare Clerk, Mr. W. G. Jayakody, has given me a good deal of assistance, particularly in connection with the correspondence with midwives, and has been very attentive to his duties.

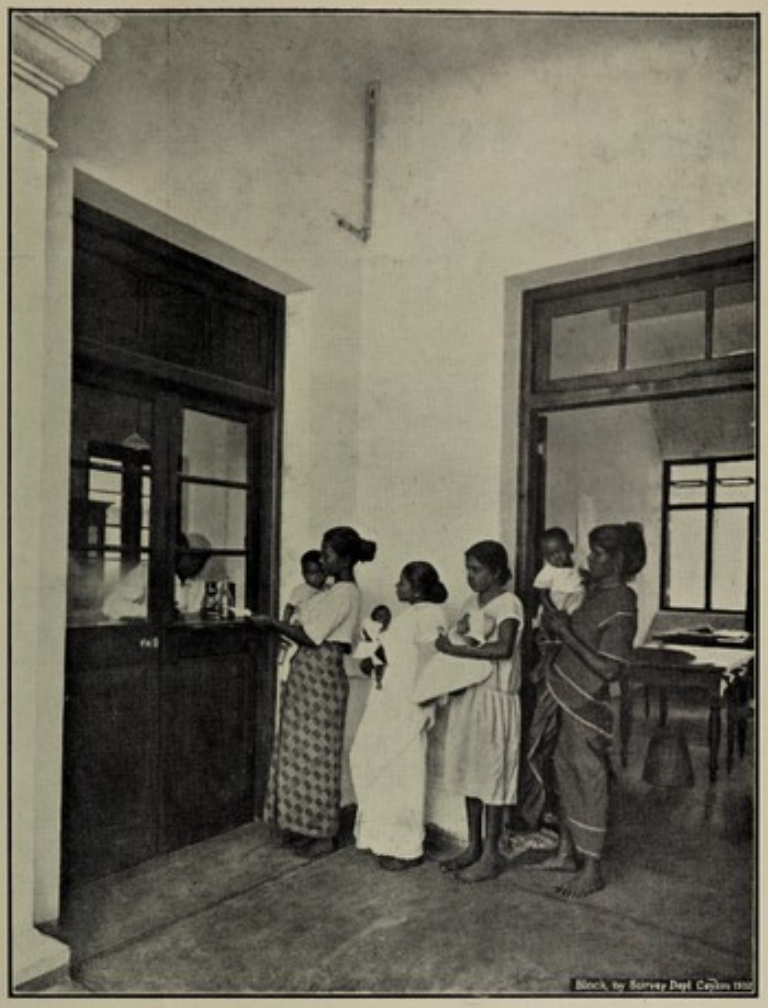
In conclusion, I have again to thank you for assistance and advice given and the whole staff for their ready co-operation.

CHAS. G. PEIRIS,

March 19, 1932. Medical Officer, Maternity and Child Welfare.

6. BABY LENA, 3 WEEKS OLD, AS SHE APPEARED WHEN SHE WAS FIRST BROUGHT TO THE CENTRE. WEIGHT 2 LB. 14½ OZ.

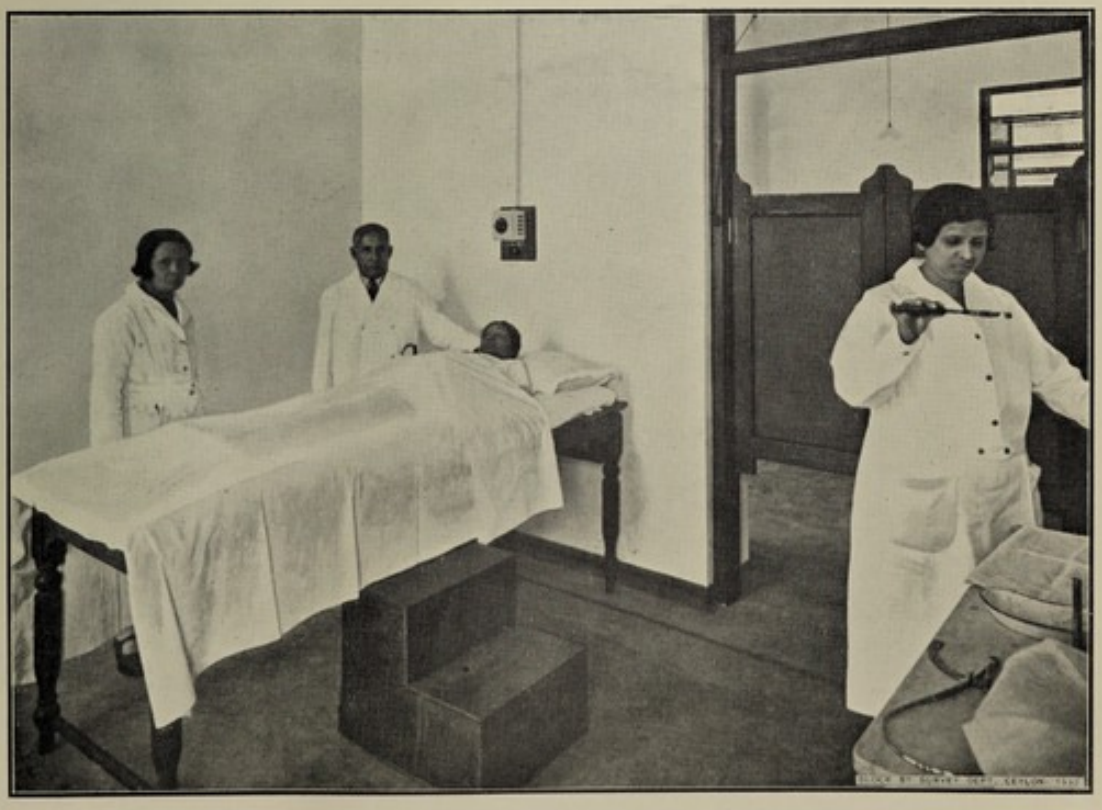
7. BABY LENA, 9 MONTHS OLD, WEIGHT 12 LB. 8 OZ.



8. FREE MILK DISTRIBUTION, C. W. CENTRE, SLAVE ISLAND.

9. EXPECTANT MOTHERS AND BABIES IN WAITING HALL, C. W. CENTRE, ST. PAUL'S.

10. SEWING CLASS AT WORK, ST. PAUL'S C. W. CENTRE.



11. EXAMINATION ROOM, ANTE-NATAL CLINIC, C. W. CENTRE, SLAVE ISLAND.

(43) *Statement of Expenditure on Milk supplied to Infants by the Child Welfare Branch during the Year 1931.*

Month.	No. of 3-lb. Tins.	Cost Rs. c.	No. of 1-lb. Tins.	Cost Rs. c.	Total Cost. Rs. c.
January	192	768 0	120	160 0	928 0
February	84	336 0	144	192 0	528 0
March	324	1,296 0	96	128 0	1,424 0
April	—	—	—	—	—
May	264	1,056 0	240	300 0	1,356 0
June	—	—	240	300 0	300 0
July	156	624 0	144	180 0	804 0
August	48	192 0	24	30 0	222 0
September	108	432 0	264	330 0	762 0
October	108	432 0	216	270 0	702 0
November	144	576 0	240	300 0	876 0
December	12	48 0	408	510 0	558 0
Total	1,440	5,760 0	2,136	2,700 0	8,460 0

(44) *List of Cases conducted by Municipal Midwives, 1931.*

Name of Midwife.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total for the Year.
Angelina Fernando	9	18	20	13	6	11	9	12	15	20	18	12	163
Pallewala Hamine	14	15	12	15	(Condemned by Medical Board August 6, 1931)								56
P. Madeline Perera	11	8	10	3	8	8	16	6	1	11	22	9	113
K. C. Perera	17	6	11	12	7	1	15	5	9	19	9	—	111
J. A. M. P. Jayasinghe	6	2	12	7	17	14	5	—	18	11	9	16	117
Inoon Jariya	6	5	10	1	9	16	7	6	16	—	9	10	95
N. Dharmaratne	18	10	—	13	7	6	7	12	10	10	1	17	111
W. A. Lilian Perera	(Appointed August 29, 1931)								8	17	9	12	46
P. A. Lily Perera	(Appointed June 15, 1931)					2	1	2	8	9	20	12	54
M. R. Sathasivam	—	1	—	3	—	10	1	2	2	4	7	3	33
Emily Direcksz	10	—	14	10	7	6	1	5	3	4	10	5	75
Arul Mary	6	7	11	6	12	3	(Dismissed on August 7, 1931)						45
Nona Suriyani	(Appointed August 29, 1931)								7	2	8	7	24
Beatrice Rajapakse	(Appointed June 15, 1931)					4	6	12	9	15	8	15	69
Inche Juhary	27	16	27	18	17	25	17	19	7	15	19	18	225
M. R. Candappa	(Appointed June 15, 1931)					7	7	9	24	14	18	13	92
Martha Fernando	(Appointed June 15, 1931)					4	13	9	10	5	17	13	71
Roslyn Perera	14	5	14	4	5	16	7	3	16	10	15	13	128
Total	138	93	141	105	95	133	112	108	163	166	199	175	1,628

(45) *Work done by Public Health Nurses during 1931.*

Name.	No. of Houses visited on Routine.	No. of Municipal Midwives' Cases visited.		No. of Ante-natal Cases visited.		No. of Babies visited.		No. of Houses where visit of M.O.C.W was recommended.
		Primary.	Revisits.	Primary.	Revisits.	Primary.	Revisits.	
Mrs. A. Cruse	3,829	62	444	256	805	340	4,149	2
Mrs. V. Misso	2,434	66	440	125	214	244	2,724	11
Mrs. F. E. M. Harris	6,000	137	959	179	879	233	285	3
Mrs. M. S. Perera	4,188	106	1,136	96	234	27	3,609	—
Mrs. I. Zieseness	1,254	67	412	71	468	140	2,241	—
Mrs. A. E. Firth	3,085	92	421	258	322	592	2,707	3
Miss A. Schokman	3,648	188	2,114	120	258	728	2,168	3
Mrs. Iris Marsden	4,500	64	212	200	266	240	1,592	7
Mrs. Martha Perera	3,412	66	462	100	584	824	1,500	6
Mrs. Q. Mortimer	1,566	48	315	31	270	39	955	—
Mrs. M. M. Samarasekera	2,498	41	228	118	336	121	1,214	2
Mrs. M. M. Marshall	3,140	36	289	145	351	236	2,439	2
Mrs. E. R. V. de Bruin	1,963	14	79	144	192	92	881	—
Mrs. Muriel A. de Silva	2,507	16	84	98	152	130	1,301	—
Mrs. Maud John	2,831	195	1,419	278	393	251	2,187	6
Mrs. Ida Ferdinand	3,561	185	1,359	267	479	277	3,909	8
Mrs. Erin Meier	2,019	112	734	403	625	1,036	1,237	9
Miss E. Jansen	1,512	86	397	198	302	334	1,620	—
Total	53,947	1,581	11,504	3,087	7,130	5,884	36,718	62

XXIV.—General Sanitation.

Statements 46 and 47 give details of work done during the year by the Ward Inspectors.

(46) *Work done by the Sanitary Staff during the Year 1931.*

1	Number of inspections		95,259
2	Number of premises where sanitary defects were found (*a*) non-structural ...		2,298
3	Number of premises where sanitary defects were found (*b*) structural ...		797
4	Number of premises where non-structural defects were rectified		1,889
5	Number of premises where minor structural defects were rectified ...		633
6	Number of buildings, other than dwellings, structurally improved ...		282
7	Number of insanitary premises scavenged by Public Health Department cleansing gang		7,081
8	Number of dwellings disinfected		2,213
9	Number of dwellings limewashed		3,081
10	Number of wells filled up		7
11	Number of cesspits filled up		1
12	Number of notices served under section 1, sub-section (1), of Ordinance No. 15 of 1882: Filthy premises		1,028
13	Number of notices served under section 190 of Ordinance No. 6 of 1910: Privy accommodation		70
14	Number of notices served under section 180 of Ordinance No. 6 of 1910: Filling up stagnant pools, &c.		8
15	Number of notices served under section 178 of Ordinance No. 6 of 1910: Cleansing and limewashing		376
16	Number of notices served under by-law 8 (1), chapter XXII., Plague Regulations: Improvement to buildings unfit for human habitation		—
17	Number of notices served under section 38, Part 1, of Plague Regulations: Filling up wells		—
18	Number of milk samples taken under rule 5, chapter XIV., Municipal by-laws ...		1,158
19	Number of prosecutions		2,182
20	Number of convictions		1,946
21	Number of cases acquitted, withdrawn, or otherwise dealt with		219
22	Number of cases pending at end of year		113
23	Amount of fines ... ... Rs. ...		14,345·50

(47) *Ward Inspectors' Statement of Prosecutions and Convictions during 1931.*

Ordinance or By-law.	Offence.	No. of Prosecutions.	*No. of Convictions.
Section 1, sub-section (1), of Ordinance No. 15 of 1862	Filthy premises ...	487 ...	429
Section 1, sub-section (1), of Ordinance No. 15 of 1862	Filthy dairy ...	14 ...	11
Section 1, sub-section (1), of Ordinance No. 15 of 1862	Filthy laundry ...	4 ...	7
Section 1, sub-section (4), of Ordinance No. 15 of 1862	Nuisance by cattle, swine, &c.	108 ...	111
Section 1, sub-section (9), of Ordinance No. 15 of 1862	Selling unwholesome food	12 ...	12
Section 102 of Ordinance No. 2 of 1883	Aiding and abetting sale of adulterated milk	3 ...	—
Section 39 of Ordinance No. 1 of 1896	Unlicensed dairy	18 ...	—
Section 53 of Ordinance No. 1 of 1896	Unregistered laundry	29 ...	45
Regulation 89 made under section 4 of Ordinance No. 3 of 1897	Storing rice in unauthorized places	14 ...	12
Section 109 of Ordinance No. 3 of 1897	Watering vegetable garden with polluted water	3 ...	3
Section 110 of Ordinance No. 3 of 1897	Spitting in public building ...	4 ...	3
Section 178 of Ordinance No. 3 of 1897	Failure to limewash	17 ...	15
Section 180 of Ordinance No. 3 of 1897	Failure to fill up swampy land ...	5 ...	1
Section 184 of Ordinance No. 3 of 1897	Committing nuisance	9 ...	4
Section 186 of Ordinance No. 3 of 1897	Failure to provide privy accommodation.	24 ...	14
Section 205 of Ordinance No. 3 of 1897	Failure to report infectious disease ...	3 ...	3
Section 31 of Ordinance No. 18 of 1907	Wasting water in laundry ...	5 ...	5
Rule 29, chapter VIII., Municipal by-laws	Digging pits and wells without permission	2 ...	3
Rule 30, chapter VIII., Municipal by-laws	Discharge of offensive liquid waste into private lands	— ...	2
Rule 31, chapter VIII., Municipal by-laws	Failure to provide dust bins ...	1 ...	—
Rule 4, chapter IX., Municipal by-laws	Filthy bathing place ...	4 ...	3
Rule 31, chapter IX., Municipal by-laws	Failure to dispose of rubbish properly ...	— ...	1
Rule 1, chapter XI., Municipal by-laws	Unlicensed eating-house ...	380 ...	344
Rule 2, chapter XI., Municipal by-laws	Unlicensed bakery	7 ...	7
Rule 7, chapter XI., Municipal by-laws	Filthy eating-house	34 ...	28
Rule 7, chapter XI., Municipal by-laws	Filthy bakery	15 ...	9
Rule 8, chapter XI., Municipal by-laws	Unclean workmen in bakery ...	5 ...	8
Rule 12, chapter XI., Municipal by-laws	Using bakery as sleeping place ...	2 ...	1
Rule 20, chapter XI., Municipal by-laws	Using eating-house for another trade ...	16 ...	7
Rule 39, chapter XII., Municipal by-laws	Slaughtering goat without permit ...	1 ...	1
Rule 3, chapter XIII., Municipal by-laws	Disorderly conduct in public market ...	55 ...	54
Rule 10, chapter XIII., Municipal by-laws	Filthy private stall	3 ...	3
Rule 22, chapter XIII., Municipal by-laws	Selling goods in public market without ticket	12 ...	7
	Carried forward	1,296	1,153

* Includes convictions on prosecutions instituted during the previous year.

(47) *Ward Inspectors' Statement of Prosecutions and Convictions during 1931*—contd.

Ordinance or By-law.	Offence.	No. of Prosecutions.	*No. of Convictions.
	Brought forward	1,296	1,153
Rule 23, chapter XIII., Municipal by-laws :	Selling goods out of stall ...	3	4
Rule 28, chapter XIII., Municipal by-laws :	Throwing rubbish in market ...	13	11
Rule 29, chapter XIII., Municipal by-laws :	Filthy market stall	4	5
Rule 34, chapter XIII., Municipal by-laws :	Obstruction of passages in public market	124	118
Rule 39, chapter XIII., Municipal by-laws :	Keeping cattle in excess of number allowed	13	7
Rule 2, chapter XIV., Municipal by-laws :	Exposing food to dust and flies ...	334	316
Rule 3, chapter XIV., Municipal by-laws :	Sale of adulterated milk ...	143	131
Rule 4, chapter XIV., Municipal by-laws :	Selling milk below standard ...	122	86
Rule 5, chapter XIV., Municipal by-laws :	Refusing sample of milk ...	1	1
Rule 7, chapter XIV., Municipal by-laws :	Unregistered milk vendor ...	129	114
	Total ...	2,182	1,946

XXV.—Food Inspection.

Mr. W. St. G. Blacker, the late Food Inspector, and also the Senior Inspector of the Council, retired on March 1, 1931, after 35 years' service. Mr. Blacker was extremely keen, and did excellent work as Food Inspector. On his retirement, the post was filled by Mr. M. Lowe, who had qualified in England as a Food Inspector. His training should prove very helpful in the performance of his duties.

(48) *Milk Sampling during the Year 1931.*

Source of Samples.	Total Number of Samples taken.	1 to 10 Per Cent. Water. No. of Samples adulterated.	1 to 10 Per Cent. Water. Percentage.	Above 10 Per Cent. Water. No. of Samples adulterated.	Above 10 Per Cent. Water. Percentage.	All Adulteration. Total No. of Samples adulterated.	All Adulteration. Percentage.
Town dairies ...	791	226	28·6	83	10·5	309	39.1
Unregistered vendors	127	41	32·3	54	42·5	95	74.8
Dairies beyond Municipal limits ...	312	100	32·1	30	9·6	130	41.7
Total ...	1,230	367	29·8	167	13·6	534	43·4

Of the 1,230 samples taken, 249 or 20·2 per cent. were found to be deficient in fat. The maximum deficiency was 67 per cent., as against 71 per cent. in previous year. The maximum adulteration with added water was 65 per cent., as against 81 per cent. in previous year.

(49) *Damaged Food Stuffs seized and Condemned.*

(*a*) By Food Inspector.

(1) *Public Markets.*

Meat	285¾	lbs.
Fish	267½	lbs.
Vegetables and fruit	83	lbs.
Potatoes	10	lbs.

(2) *In Private Markets.*

Meat	12½	lbs.
Fish	41	lbs.
Dry fish	66½	lbs.
Vegetables and fruit	21	lbs.
Tinned food	236	tins.
Sweetmeats	5	plates.
Rotties	5	dishes.
Stale rice	7	pots.
Stale soup	2	pots.
Stale bread	10	lbs.
Stale curries	8	dishes.

(*b*) By Ward Inspectors.

At Customs Premises.

Sugar	10	bags.
Rice	9¼	bushels.

At Chalmers Granaries.

Rice	430¼	bushels.

* Includes convictions on prosecutions instituted during the previous year.

In Public Markets.

Fish	400 lbs.

In Private Markets in the Town.

Rice	21¼ bushels.
Damaged potatoes ...	12 tons 12 cwts 2 qrs 11 lbs.
Condensed milk	110 tins.
Apples	1 box.

Samples of Food and Drink taken to City Analyst by Food Inspector.

Milk	67
Milk powder	1
Milk (concentrated)	1
Arrack	5
Tea	7
Vinegar	2
Tinned food	146

Prosecutions entered by Food Inspector.

Adulteration of milk	24
Unregistered milk vendors ...	14
Deficiency of fat	15
Putrid meat and fish	5
Good exposure	48
Unlicensed fish vendors	4
Filthy eating-houses	1
Total amount of fines ...	Rs. 1,989

(50) *Food Trades Inspections during the Year 1931—Number of Inspections.*

Ward.	Bakeries.	Dairies.	Eating-houses.	Public Market.
Fort	57 ...	—* ...	1214 ...	—†
Pettah	190 ...	—* ...	1338 ...	151
San Sebastian	87 ...	—* ...	860 ...	136
St. Paul's	223 ...	417 ...	548 ...	64
Kotahena	171 ...	241 ...	181 ...	114
Mutwal	100 ...	138 ...	136 ...	93
New Bazaar	192 ...	290 ...	301 ...	—†
Maradana North	92 ...	420 ...	852 ...	12
Maradana South	94 ...	—* ...	922 ...	122
Dematagoda	169 ...	164 ...	510 ...	—†
Slave Island	272 ...	148 ...	928 ...	168
Kollupitiya	138 ...	222 ...	496 ...	81
Cinnamon Gardens	33 ...	255 ...	463 ...	129
Bambalapitiya	181 ...	199 ...	577 ...	199
Timbirigasyaya	26 ...	219 ...	86 ...	—†
Wellawatta	80 ...	154 ...	240 ...	70
Total ...	2,105 ...	2,867 ...	9,652 ...	1,339
By Food Inspector	48 ...	99 ...	160 ...	254
Grand Total ...	2,153	2,966	9,812	1,593

XXVI.—Markets.

The new market at Dematagoda was opened on August 1, 1931, thus bringing the number of Municipal markets up to 14. A new market at Urugodawatta has been sanctioned, and will be constructed during the course of 1932. There appears to be no likelihood of building the urgently needed central market in the near future.

XXVII.—Dairies.

Number at the beginning of the year	59
New dairies registered during the year	—
Number of dairies discontinued	1
Total at the end of the year	58

38 dairies were involved in prosecutions for adulteration and 25 for other offences.

Number of Convictions.

Offence.	Number of Convictions, 1930.	Number of Convictions, 1931.
Selling adulterated milk	113 ...	69
Selling milk deficient in fat	59 ...	32
Filthy dairy	19 ...	11
Keeping cows in excess of the number allowed	21 ...	7
Total ...	212 ...	119

* No dairies in these wards.

† No public markets in these wards.

XXVIII.—Bakeries.

Number at the beginning of the year	52
New bakeries registered	3
Number discontinued	—
Total at the end of the year	55

19 bakeries were involved in prosecutions.

Number of Convictions.

Offence.	Number of Convictions, 1930.	Number of Convictions, 1931.
Unlicensed bakery	—	7
Filthy bakery	13	9
Unclean workmen in bakery	7	8
Using bakery as sleeping place	—	1
Total	20	25

XXIX.—Eating-houses.

There were 499 eating-houses at the end of the year.

Number of Convictions.

Offence.	Number of Convictions.
Exposing food to dust and flies	316
Unclean eating-house	28
Unlicensed eating-house	344
Selling unwholesome food	12
Total	700

The large number of unlicensed eating-houses was due to the failure of many existing houses to conform to the new by-laws which were passed in August, 1930.

XXX.—Laundries.

(*a*) *Public Laundries.*

At the end of the year, the construction work of the new laundry at Armour street had advanced considerably, and was expected to be ready for occupation early in 1932.

(*b*) *Private Laundries.*

Number at the beginning of the year	298
Number discontinued	29
Number of new ones registered	39
Number at the end of the year	308

XXXI.—Lavatories.

(*a*) *Public Lavatories.*

Three new public lavatories were constructed and opened to the public during the year at Lotus road, Rajamalwatta East, and Fishers' quarters; and one lavatory, near the Young Men's Christian Association, Fort, which was an eyesore and a frequent subject of complaint, was closed to the public, thus bringing the total number of public lavatories to 71.

Three more lavatories have been sanctioned for construction during the year 1932 at Alutmawatta, Floor's lane, and Silversmith street.

(*b*) *Private Lavatories.*

During the year, 370 pail latrines were abolished, and 1,289 new water closets installed, the total number of premises drained at the end of 1931 being 9,625, as against 9,169 at the end of 1930. Enforcement of connection to sewer is now required only in those cases where a serious nuisance exists, and when the Medical Officer of Health certifies that the nuisance is such as to constitute a danger to health.

XXXII.—Mosquito Prevention.

The work done in this connection is shown in the statement below.

(51) *Complaints from Householders.*

Number of complaints	367
Number of premises visited	1,291
Number of potential breeding places found	15,408
Number of actual breeding places found	3,436

General Inspection.

Number of premises visited	3,351
Number of tenements visited	960
Number of potential breeding places found	40,207
Number of actual breeding places found	4,878

XXXIII.—Disinfecting and Cleansing.

Number of van loads of clothing, &c., disinfected	...	124
Number of articles included in above ...	...	3,964

10,631 dwellings were disinfected by the Sanitary staff during the year, and 7,081 premises were cleansed by the Public Health Department Cleansing gang.

XXXIV.—Housing.

The Kochchikadde Slum Improvement Scheme is making good progress—twenty-four dwellings were completed by the end of the year, and thirty-three more are under construction.

List of Premises improved in 1930.

San Sebastian.

No. 40, San Sebastian street.

Kotahena.

No. 37-38, Jampettah street.
No. 25, Kotahena street.

New Bazaar.

No. 65, Grandpass road.
No. 36-38, Silversmith street.
No. 94, Molawatta.

Maradana North.

No. 201, Dematagoda street.
No. 109, First Division, Maradana.
No. 197, Second Division, Maradana.
No. 103^{2}, Dematagoda road.
No. $47^{25\,A\text{-}F}$, Drieberg's lane.

Maradana South.

No. 33, Forbes lane.
No. 2-8, Forbes lane.
No. 11, Stafford place.
No. 11-13, Forbes road.
No. 37-45, Darley road.
No. 27-33, Darley road.
No. $147^{1\text{-}8}$, Darley road.
No. 184-228, Dean's road.

Dematagoda.

No. 15-17, Second Maligakanda lane.
No, 19-41, Maligakanda road.
No. 621-623, Third Division, Maradana.

Slave Island.

No. 13, Stewart street.
No. 50-58, Glennie street.
No. 26, Church street.

(52) *Statement of Work done by the Inspector of Insanitary Buildings during the Year 1931.*

1.	Number of plans called for from Municipal Engineer... ...		49
2.	Number of plans received		55
3.	Number of applications for "closing order"		35
4.	Number of "closing orders" issued		28
5.	Number of applications for "closing order" struck off ...		3
6.	Number of applications for "closing order" pending ...		4
7.	Number of prosecutions for allowing premises to be occupied after "closing order"		18
8.	Number of closing order notices affixed to buildings		84
9.	Number of premises vacated after "closing order"		3
10.	Number of tenements vacated under (9) above		23
11.	Number of persons dishoused		81
12.	Number of premises improved		25
	(*a*) Number of tenements in (12)		446
	(*b*) Number of rooms demolished in (12)		152
	(*c*) Number of persons dishoused in (12)		269
	(*d*) Number of new doors provided in (12)		49
	(*e*) Number of new windows provided in (12)		227
	(*f*) Number of doors enlarged in (12)		218
	(*g*) Number of windows enlarged in (12)		80
	(*h*) Number of rooms cemented in (12)		621
	(*i*) Number of masonry partitions removed in (12) ...		2
	(*j*) Number of plank partitions removed in (12) ...		21
	(*k*) Number of gunny partitions removed in (12) ...		—
	(*l*) Number of rooms in which masonry walls have been replaced by trellis in (12)		265
	(*m*) Spaced unroofed in (12)		563 sq. feet.
	(*n*) Length of roof raised in (12) ...		1,890 feet.
13.	Amount of fines	Rs.	125

XXXV.—Municipal Free Dispensaries.

The Slave Island dispensary, which was housed in a very unsatisfactory and small rented building, moved into its new and spacious quarters erected by the Council in Lake road on July 1, 1931.

Owing to the existing financial state of the country the incomes of many people have been reduced, and, in consequence, larger numbers seek free treatment at the Municipal dispensaries. During the year under review, 93,766 were treated at the seven Municipal dispensaries, as against 86,800 in the year 1930.

(53) *Work done at the Municipal Free Dispensaries during 1931.*

	Slave Island Dispensary.	St. Paul's Dispensary.	Maradana Dispensary.	Mutwal Dispensary.	New Bazaar Dispensary.	Wellawatta Dispensary.	San Sebastian Dispensary.	Total.
Number of patients treated ...	22,504	10,697	18,648	13,842	8,090	9,604	10,381	93,766
Number of visits by patients ...	44,963	19,045	32,318	22,301	16,479	21,728	17,856	174,690
Daily average attendance ...	145	61	104	72	53	70	57	562
Number of outdoor visits by the Medical Officers ...	74	55	63	276	34	40	5	547
Number of labour cases in which medical or surgical aid was rendered	—	128	150	—	—	48	1	327
Number of Municipal employees treated	457	52	96	51	248	228	2	1,134
Number of persons inoculated against typhoid... ...	8	1	44	23	5	17	—	98

XXXVI.—Staff Changes.

Dr. H. Ratnarajah, one of the Assistant Medical Officers of Health, left for England on long leave on October 5, 1931, and he is expected back on May 23, 1932.

XXXVII.—Expenditure—1931.

	Head of Expenditure.	Estimated Expenditure. Rs. c	Actual Expenditure. Rs. c	Saving. Rs. c
1.	Higher Staff (office)	60,240 0	60,799 83	—
2.	Clerical Staff	24,648 0	24,648 0	—
3.	Sanitary Branch	155,021 0	141,900 10	13,120 90
4.	Dispensaries	85,060 0	82,665 79	2,394 21
5.	Markets	46,191 0	43,314 91	2,876 9
6.	Cemeteries	27,331 0	24,452 71	2,878 29
7.	Laboratory	39,461 0	38,025 33	1,435 67
8.	Laundries	3,276 0	3,263 73	12 27
9.	Child Welfare	69,101 0	69,977 39	—
10.	Health Education and Propaganda Work...	2,000 0	1,533 42	466 58
11.	Anti-plague Campaign—			
	(*a*) Fumigation	58,700 0	51,123 77	7,576 23
	(*b*) Rat Destruction	49,125 0	40,473 87	8,651 13
	Total ...	620,154 0	582,178 85	39,411 37

Annexure A.

REPORT OF THE CITY MICROBIOLOGIST FOR 1931.

1.—Laboratory.

A new perpetual card index inventory system for both consumable stock and permanent equipment was inaugurated during this year.

An official visit to Burma was paid between January 26 and February 4, 1931, to inquire into the rice export trade in relation to plague and the danger of transference of the rat-flea *X. cheopis* overseas. Much valuable information was obtained, thanks to the courtesy of Lt.-Col. G. G. Jolly, C.I.E., I.M.S., the Director of Public Health, Major Cotter, I.M.S., Director, the Harcourt Butler Institute, and many other officials. A special report was submitted to Council and some of the findings published in my report on "The Protection of the Interior of Ceylon from Plague with special reference to the Fumigation of Plague-suspect Imports."

2.—Analysis of Routine Work.

(*a*) *General Distribution of Routine Specimens examined during 1931.*

Clinical specimens	2,294
Town water	196
Rat-fleas for species distribution	12,083
Rodents plague—	
Port Commission	1,636
Public Health Department	26,415
Veterinary Department—	
Goat blood for anthrax	511
Goat spleens for anthrax	8
Miscellaneous	6
Rats for Flea Index—	
Port Commission	4
Public Health Department	2,786
Total ...	45,939

(b) Distribution of Clinical Specimens.

	Examined for	Number received.	Number Positive.
Diagnostic service for practitioners ...	Enteric ...	349 ...	87
	Human plague ...	4 ...	—
	Tuberculosis ...	217 ...	44
	Dysentery ...	325 ...	67
	Diphtheria ...	84 ...	61
	Hookworm ...	278 ...	91
	Malaria ...	102 ...	8
	Various ...	302 ...	162
Public Health Department ...	Enteric ...	504 ...	2
	Human plague ...	25 ...	11
	Tuberculosis ...	5 ...	2
	Dysentery ...	7 ...	—
	Diphtheria ...	14 ...	1
	Hookworm ...	11 ...	5
	Malaria ...	— ...	—
	Cholera ...	4 ...	2
	Various ...	63 ...	26
	Total ...	2,294	569

(c) Distribution of Rodents examined for Plague in 1931.

(1) By Mode of Capture.

Species.		Number examined.	Number infected.	Percentage infected.
Trapped rats ...	R. rattus ...	15,178 ...	2 ...	0·01
	R. norvegicus ...	4,158 ...	2 ...	0·04
	M. musculus ...	820 ...	0 ...	—
	Bandicoots ...	42 ...	0 ...	—
Rats found dead ...	R. rattus ...	277 ...	6 ...	2·17
	R. norvegicus ...	288 ...	4 ...	1·39
	M. musculus ...	81 ...	2 ...	2·47
	Bandicoots ...	5 ...	0 ...	—
Rats killed by fumigation ...	R. rattus ...	1,100 ...	2 ...	0·18
	R. norvegicus ...	2,964 ...	4 ...	0·13
	M. musculus ...	3,116 ...	2 ...	0·06
	Bandicoots ...	22 ...	0 ...	—
	Total ...	28,051	24	0·09

Four cats forwarded by the Public Health Department were examined for plague; one was found to be plague infected.

(2) By Species and Source.

		Trapped Alive.			Found Dead.			Killed by Fumigation.		
		Number examined.	Number infected.	Percentage infection.	Number examined.	Number infected.	Percentage infection.	Number examined.	Number infected.	Percentage infection.
R. rattus ...	Public Health Department ...	15,124 ...	2 ...	0·01 ...	274 ...	6 ...	2·19 ...	938 ...	2 ...	0·21
	Port Commission ...	54 ...	0 ...	— ...	3 ...	0 ...	— ...	162 ...	0 ...	—
R. norvegicus	Public Health Department ...	4,132 ...	2 ...	0·05 ...	288 ...	4 ...	1·39 ...	2,829 ...	4 ...	0·14
	Port Commission ...	26 ...	0 ...	— ...	0 ...	0 ...	— ...	135 ...	0 ...	—
M. musculus.	Public Health Department ...	814 ...	0 ...	— ...	81 ...	2 ...	2·47 ...	1,874 ...	2 ...	0·11
	Port Commission ...	6 ...	0 ...	— ...	0 ...	0 ...	— ...	1,242 ...	0 ...	—

Forty-two bandicoots trapped, 5 bandicoots found dead, and 22 bandicoots killed by fumigation were negative for plague.

3.—Research Work.

Ceylon Rat-Flea Survey.—The island-wide rat-flea survey of Ceylon was completed during the year in co-operation with officers of the Government Sanitation Department who supervised the collections made by an itinerant rat-gang trained in this laboratory. Nearly every important centre of population has now been surveyed. No attempt has been made at an intensive survey on biometric lines such as those carried out in Colombo, but sufficient rat-fleas have been

collected from different types of premises in each locality to give a good idea of the relative distribution of the various species throughout Ceylon. Collections from the following stations were made in 1931. All the fleas were identified by the writer :—

Negombo	Tangalla	Talawakele
Chilaw	Matara	Hatton
Kayts	Avissawella	Nuwara Eliya
Jaffna	Yatiyantota	Badulla
Kankesanturai	Ratnapura	Bandarawela
Point Pedro	Kurunegala	Haputale
Batticaloa	Anuradhapura	
Hambantota	Nawalapitiya	

The analysis of the results is approaching completion. They show clearly that the lowlands of Ceylon, taken as a whole, constitute a vast *X. astia* area in process of infiltration with *X. cheopis*, probably grain-borne. The invasion is preceding on irregular lines. Thus *X. cheopis* is well established only at Kurunegala and Anuradhapura and it appears to have gained a footing at Negombo and Trincomalee, but towns such as Kalutara and Galle are still practically free despite the importation of much grain and other goods from the *cheopis* areas of Colombo.

In the highlands *X. cheopis* is well distributed on the rats of urban districts. It reaches its maximum proportionate prevalence at about the 4,000 feet elevation. Thus more than 90 per cent. of the rat-fleas of Hatton, Talawakele, and Bandarawela are *X. cheopis*. At the highest stations, such as Nuwara Eliya, *X. cheopis* tends to fall off again and fleas appear adapted to a temperate climate. The predominant rat-flea at the 6,000 feet elevation is another imported species *Leptopsylla segnis*, the European mouse-flea : at this height the indigenous hill-country field rodent fleas, *Stivalius phoberus* and *Ceratophyllus tamilanus* form an appreciable proportion of the fleas found upon domestic rats.

It is evident from a comparison of the results at Ceylon and Indian hill stations that *X. astia* is not well adapted to a cool climate and tends to disappear as elevation increases. *X. cheopis* is clearly a much more adaptable species. The relatively restricted geographical distribution of *X. astia* as compared with its cosmopolitan congener points to the same conclusion. The general results of the Ceylon rat-flea survey accord well with those recently obtained by King and his colleagues in the course of their survey of the Madras Presidency, save that the lowland districts watered by both south-west and north-east monsoons are at least as resistant to penetration by *X. cheopis* as those watered only by the north-east, so that a prolonged hot weather will not account for the purity of the *astia* rat-flea population of the Southern and Western Provinces of Ceylon outside Colombo as King and Pandit have suggested it does for the pure *astia* eastern lowlands of Madras Presidency.

Taking into consideration the combined results of the Ceylon and Madras rat-flea surveys, it would seem justifiable to conclude that those parts of the Ceylon lowlands which are still free from *cheopis* are only liable to very mild outbreaks of plague showing no tendency to carry over from season to season.

The plague danger zones may be considered to be the bazaar quarters in Colombo, Kurunegala, and Anuradhapura with a high *cheopis* index and more especially the mountain region between 1,500 and 4,500 elevation. It is in the latter region that the majority of plague outbreaks have so far occurred.

The following may be quoted from the final report on the Madras Presidency rat-flea survey by H. H. King and C. G. Pandit : "So far as South India is concerned our survey confirms the theory of Hirst, which was supported by Cragg, that plague in India is mainly caused by *cheopis*." (Indian Journal of Medical Research 19, 390.)

Hookworm Disease and Sewage Works.

The report on hookworm infestation in sewage works was completed this year. It will appear in the forthcoming number of the Ceylon Journal of Science, Section D.

Evidence has been produced that labourers employed in water carriage sewage disposal works in the tropics are liable to contract hookworm infection or develop definite hookworm disease. An account is given of two such outbreaks, one arising from digging up sludge trenches and the other from emptying a sludge pit. Other operations attended with risk are work of any description in sewers or septic tanks. It is urged that sludge from tropical sewage systems should be dealt with, as far as possible, by mechanical means and that labourers working in sludge fields infested with hookworm larvæ should be provided with gum boots.

The highest count of hookworm ova entering the septic tanks at the Madampitiya works was 830 per litre. Roundworm ova were ten times, and whipworm one-third as numerous. As might be expected, typical hookworm larvæ are rarely found in either the raw sewage or the effluent from the treatment works. Hookworm ova do not develop in sewage. Sludge from the two-storey septic tanks at Madampitiya yielded a mean count of 28 hookworm ova per gramme and also many round and whipworm ova. Typical hookworm larvæ were readily cultivated from this sludge.

Passage of the Angoda asylum sewage through the three circular two-storey Imhoff pattern tanks eliminated 99·6 per cent. of both the hookworm and the roundworm eggs in the raw sewage. Most of the work was done by the first tank, which eliminated 98·1 per cent. hookworm eggs and 95·6 per cent. of those of the roundworm from representative twenty-four samples of sewage and effluent. The rate of elimination was much the same as that of suspended solids as determined independently by the Government Analyst. All the quantitative ova estimations were made by the Clayton Lane direct centrifugal flotation technique, centrifuging to approximate finality.

Hookworm larvæ were cultivated from the sludge of the Angoda septic tanks up to the twenty-third day of discharge into the sludge lagoon.

By fitting a glass cover to one of the two sludge lagoons it was found possible to raise the temperature of a one foot deep layer of semi-liquid sludge to 63°C. after many hours exposure to bright sun for three days in succession ; such a degree of heat is amply sufficient to kill hookworm eggs or larvæ and render the sludge safe to handle. The glass cover also serves to protect the sludge from rain and so expedite drying. During cloudy weather the maximum temperatures attainable in the glazed pan are of the order of 44°C., a temperature sufficiently high to hasten the death of hookworm ova but not to kill them at once. It is suggested that the sludge be discharged whenever possible during spells of bright sunny weather, heated for a day or two with the glass cover down, after which drying off could be completed with the cover slightly raised to promote ventilation and rapid evaporation of water from the disinfested sludge.

Anthrax among Imported Goats.

An attempt was made to trace the source of the anthrax infected goats imported from India for slaughter by examination of samples of soil collected by our Veterinary Surgeon at goat-sheds and grazing grounds between Bangalore and Tuticorin, the port of embarkation, but anthrax was only isolated from goatsheds at the Colombo Quarantine Station, where the sick animals are segregated. The strain had the characters of type B. of Bordet and Renaux giving porcelain dome-shaped secondary colonies.

Cyanide Fumigation.

Some additional experiments on fumigation of compartments at the Chalmers Granaries were carried out using the commercial preparation known as HCN 'Discoids.' The complete series of experiments undertaken since 1929 will be reported in the Ceylon Journal of Science.

Amœbiasis in Watershed Premises.

A preliminary survey was made of the Hiyare watershed. No macaques were caught. Seven langurs showed amœbae of the coli type but gave entirely negative results for *Entamœba histolytica.*

L. F. HIRST,
City Microbiologist.

March 7, 1932.

Annexure B.

CITY ANALYST'S ANNUAL REPORT, 1931.

A total of 1,466 samples were submitted for analyses during the year 1931, of which 1,230 were milk samples, 193 town waters, and 39 miscellaneous.

The city water supply retained its high state of purity during the year under review. It is hoped that the supply will be chlorinated at an early date and remove all suspicion that may arise and at the same time place the city water supply on an up-to-date basis.

Four samples of well water were examined of which three were condemned and one considered suspicious. The several samples of pit waters examined used for watering gardens could only be used for that purpose and not for human consumption. Some of the Kotahena pit waters examined were too high in salt even for use in gardens.

Thirty-nine miscellaneous samples were examined. Four arracks were found to pass the Government limit in copper. Two samples of vinegar showed low content of acetic acid, no mineral acid were found to be present but one of the samples had a high copper content.

Several rubbishy tea factories were visited in Colombo with the Food Inspector. Several samples of retrieved teas and their raw product factory sweepings were obtained. Retrieved teas do not have a high state of purity and are not worthy of Ceylon tea trade and plantations. The conditions under which retrieved teas are procured are anything but sanitary and such teas exported would damage Ceylon's name as a tea producing country if their origin and method of separation were known.

Representations were made to the tea trade authorities to stop the supply of tea factory sweepings. The supply of rubbishy teas obtained from tea factory sweepings are now on the decrease.

Two sets of sewage samples were tested. No clear deduction could be made from the May set as they were collected in wet whether. The October set of sewage samples indicated that there was a falling off of 10 per cent. purification under the conditions of these tests.

The milk supply of Colombo is less satisfactory than in previous years, although there is a small improvement on the tests made during 1930. Table annexed gives a tabulated result of period and adulteration. A total of 56·6 per cent. of the milk tested passed the Municipal milk standard of solids-not-fat an improvement of 7 per cent. compared to the previous year. January (44.4 per cent.) and June (43·3 per cent. passes) were the worst months, August (63·9 per cent. passes) and November (66·4 per cent. passes) were the best months of passes. Milks having 1 to 10 per cent. adulteration amounted to 29·8 per cent. January and June being the highest in non-passes of this amount; 40·7 per cent. and 45·5 per cent. respectively. The 11 to 30 per cent. adulteration class amounts to 9·7 per cent., the highest months being March 14·9 per cent. and November 12·1 per cent. Over 31 per cent. adulteration amounts to 3·9 per cent. the worst months being January, February, and July. The maximum adulteration was 65 per cent. in December.

Fat deficiency of the total samples tested amounted to 20·2 per cent., 5·5 per cent. of the samples fell under the scale 1 to 10 per cent. deficiency, 10·7 per cent. of the samples in the 11 to 30 per cent fat deficiency, and 4·1 per cent. in over 31 per cent. fat deficiency scale. The maximum deficiency amounted to 67 per cent. of the Municipal milk standard.

The Laboratory, Turret road south,
Colombo, February 5, 1932.

ALEXANDER BRUCE,
City Analyst.

Sample Index.

Months.	Town Water.	Well Water.	Miscellaneous.	Milk. (Total)
January ...	16 ...	— ...	3 pit waters, 1 arrack	108
February ...	16 ...	— ...	3 pit waters, 1 arrack	103
March ...	16 ...	2 ...	6 pit waters	94
April ...	16 ...	1 ...	1 pit water, 5 sewages	98
May ...	17 ...	— ...	— —	97
June ...	16 ...	— ...	— —	97
July ...	16 ...	— ...	— —	103
August ...	16 ...	— ...	— —	108
September ...	16 ...	— ...	7 teas, 1 Bachus Marsh condensed milk, 1 Cow and Gate milk, 1 condensed milk, 1 arrack ...	106
October ...	16 ...	— ...	2 vinegars, 1 arrack, 4 sewages ...	105
November ...	16 ...	— ...	1 arrack, 3 milks from Municipal Courts ...	107
December ...	16 ...	1 ...	— —	104
Total ...	193	4	39	1,230
			Grand Total ...	1,466

Well Waters, 1931.

Months.	Well Waters.	Pass.	Condemned.	Suspicious.
January ...	— ...	— ...	— ...	—
February ...	— ...	— ...	— ...	—
March ...	2 ...	— ...	1 ...	1
April ...	1 ...	— ...	1 ...	—
May ...	— ...	— ...	— ...	—
June ...	— ...	— ...	— ...	—
July ...	— ...	— ...	— ...	—
August ...	— ...	— ...	— ...	—
September ...	— ...	— ...	— ...	—
October ...	— ...	— ...	— ...	—
November ...	— ...	— ...	— ...	—
December ...	1 ...	— ...	1 ...	—
Total ...	4	—	3	1
Grand Total ...	4			

Milk Analyses.

Added Water, 1931.

Months.	Total Number of Samples examined.		Pass.	1-10 Per Cent.	11-30 Per Cent.	+ 31 Per Cent.	Maximum.
January ...	108	No. of samples	48 ...	44 ...	9 ...	7 ...	53 per cent.
		Per cent. of samples	44·4 ...	40·7 ...	8·3 ...	6·5 ...	
February ...	103	No. of samples	58 ...	27 ...	11 ...	7 ...	59 per cent.
		Per cent. of samples	56·3 ...	26·2 ...	10·7 ...	6·8 ...	
March ...	94	No. of samples	53 ...	26 ...	14 ...	1 ...	38 per cent.
		Per cent. of samples	56·4 ...	27·7 ...	14·9 ...	1·1 ...	
April ...	98	No. of samples	56 ...	30 ...	11 ...	1 ...	34 per cent.
		Per cent. of samples	57·1 ...	30·6 ...	11·2 ...	1 ...	
May ...	97	No. of samples	58 ...	29 ...	8 ...	2 ...	62 per cent.
		Per cent. of samples	59·8 ...	29·9 ...	8·2 ...	2·1 ...	
June ...	97	No. of samples	42 ...	44 ...	9 ...	2 ...	40 per cent.
		Per cent. of samples	43·3 ...	45·5 ...	9·3 ...	2·1 ...	
July ...	103	No. of samples	58 ...	27 ...	11 ...	7 ...	42 per cent.
		Per cent. of samples	56·3 ...	26·2 ...	10·7 ...	6·8 ...	
August ...	108	No. of samples	69 ...	32 ...	5 ...	2 ...	61 per cent.
		Per cent. of samples	63·9 ...	29·6 ...	4·6 ...	1·9 ...	
September ...	106	No. of samples	67 ...	23 ...	12 ...	4 ...	47 per cent.
		Per cent. of samples	63·2 ...	21·7 ...	11·3 ...	3·8 ...	
October ...	105	No. of samples	53 ...	36 ...	10 ...	6 ...	54 per cent.
		Per cent. of samples	50·5 ...	34·3 ...	9·5 ...	5·7 ...	
November ...	107	No. of samples	71 ...	18 ...	13 ...	5 ...	50 per cent.
		Per cent. of samples	66·4 ...	16·8 ...	12·1 ...	4·7 ...	
December ...	104	No. of samples	63 ...	31 ...	6 ...	4 ...	65 per cent.
		Per cent. of samples	60·6 ...	29·8 ...	5·8 ...	3·8 ...	
Total 1931 ...	1,230	No. of samples	696 ...	36·7 ...	11·9 ...	48 ...	65 per cent.
		Per cent. of samples	56·6 ...	29·8 ...	9·7 ...	3·9 ...	
1930 ...	1,261	Per cent. of samples	49·6 ...	33·2 ...	12·1 ...	5·1 ...	81 per cent.

Milk as Sold—Fat Deficiency, 1931.

Months.	Total Milks.	Total below Standard.	1-10 Per Cent.	11-30 Per Cent.	+31 Per Cent.	Maximum.
January	108	24=22·2 per cent.	8	12	4	46 per cent.
February	103	23=22·3 per cent.	3	12	8	43 per cent.
March	94	18=19·2 per cent.	6	9	3	51 per cent.
April	98	18=18·4 per cent.	6	10	2	63 per cent.
May	97	10=10·3 per cent.	5	4	1	34 per cent.
June	97	17=17·6 per cent.	3	12	2	43 per cent.
July	103	21=20·4 per cent.	4	12	5	67 per cent.
August	108	24=22·2 per cent.	6	10	8	49 per cent.
September	106	20=18·9 per cent.	4	11	5	43 per cent.
October	105	25=23·8 per cent.	9	12	4	60 per cent.
November	107	31=29 per cent.	12	14	5	53 per cent.
December	104	18=17·3 per cent.	2	13	3	43 per cent.
Total 1931	1,230	249=20·2 per cent.	68=5·5%	131=10·7%	50=4·1%	67 per cent.
1930	1,261	318=25·2 per cent.	91=7·2%	142=11·3%	85=6·7%	71 per cent.

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