

The annual report of the Medical and Health Departments, Kedah and Perlis.

Contributors

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REPORT

OF THE

MEDICAL AND HEALTH DEPARTMENTS

KEDAH AND PERLIS

FOR THE YEAR

1935 A.D.



(25th RAMTHAN, 1353 A.H. TO 5TH SHAWAL, 1354 A.H.)

BY

J. GRAY M.D.,

STATE SURGEON TO THE KEDAH GOVERNMENT.

Alor Star:

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REPORT

MEDICAL AND HEALTH DEPARTMENT

REPORT AND STATEMENT



1933

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MEDICAL AND SANITARY REPORT, KEDAH.

FOR THE YEAR 1935 A. D.

(25th Ramthan, 1353 A.H. to 5th Shawal, 1354 A.H.)

I. ADMINISTRATION.

(a) STAFF.

The principal appointments are:—

- The State Surgeon (also State Surgeon for the Perlis Government).
- The Acting Senior Health Officer.
- The Health Officer.
- 2 Medical Officers.
- 1 Lady Medical Officer—stationed at Alor Star.
- 1 Pathologist.
- 1 Assistant Medical Officer.
- 1 Assistant Surgeon, attached to the Pathologist Office.
- 6 Assistant Surgeons.
- 3 European Nursing Sisters.
- 51 Dressers.
- 4 Laboratory Assistants.
- 1 Qualified Dispenser—Storekeeper.
- 4 Asiatic Nurses.
- 8 Asiatic certificated midwives (attendant class).
- 4 Vaccinators.
- 5 Health Inspectors attached to the Health Office.
- 13 Health Inspectors attached to the various Sanitary Boards.

(b) CHANGES IN THE STAFF.

Dr. E. C. Chitty, Medical Officer, North Kedah, proceeded on furlough on 22-3-35 (16-12-53) and was relieved by Dr. S. J. Campbell who was seconded from Singapore on 22-3-35 (16-12-53).

Miss D. G. Jones, Nursing Sister, proceeded on furlough prior to retirement on 22-12-35 (26-9-54) and was relieved by Miss D. V. McKenzie on 20-12-35 (24-9-54).

Miss A. A. Gentles was seconded for service from Johore on 4-2-35 (27-10-53) as an additional Nursing Sister.

Dr. M. B. Mustapa, Government Pathologist, Sungei Patani, proceeded on furlough to further his studies on 31-8-35 (1-6-54).

NEW APPOINTMENTS.

- 1 European Nursing Sister was appointed.
- 1 Asiatic Nurse was appointed.
- 1 Probationer Dresser was appointed.
- 1 Clerk was appointed.
- 2 Probationer Health Inspectors were appointed.
- 1 Clerk retired on pension and gratuity.

(c) LEGISLATION.

The following Enactments, Rules, Bye-laws and Forms having a bearing on the Public Health were passed or amended during the year:—

The Air Navigation Enactment No. 17 of 1353.

The Carriage by Air Enactment No. 6 of 1354.

The addition of Cerebro Spinal Fever, Diphtheria and Typhoid to the list of dangerous infectious or contagious diseases for the purposes of Part VIII of the Labour Code.

The Gazetting of a New Malarial Return Form for estates under the Labour Code Section 198 (1) (d).

The notification of a draft Town Plan of Sungei Patani under the Town Planning Enactment.

(d) FINANCIAL.

The revenue for the years 1934 and 1935 was as follows:—

	1934.	1935.
Medical Department	\$ 9,385.65	\$12,182.24
Health Branch	462.50	370.00
Pathological Branch	271.00	168.82
	<hr/>	<hr/>
Total, Revenue	\$10,119.15	\$12,721.06

The expenditure for the years 1934 and 1935 was as follows:—

Expenditure	1934		1935	
	Personal Emoluments	Other Charges	Personal Emoluments	Other Charges
	\$	c.	\$	c.
Medical Department (S.S.)	1,891	55 45	176,917	90
Health Branch	20,739	14	27,819	72
Pathological Branch	8,107	00	8,821	00
	<hr/>	<hr/>	<hr/>	<hr/>
Total Expenditure	218,001	59	193,921	88
	<hr/>	<hr/>	<hr/>	<hr/>
	223,437	71	207,179	53

(e) DISTRICTS.

The State is divided into four Districts for the purpose of Medical and Health administration:—

North, Central, South and the Island of Langkawi and the adjoining islands.

North Kedah has an area of 1,549 square miles with an approximate population of 228,420.

Central Kedah has an area of 1,546 square miles with an approximate population of 122,241.

South Kedah has an area of 553 square miles with an approximate population of 80,736.

The Island of Langkawi and the adjoining islands have an area of 59 square miles with an approximate population of 11,157.

Table IA gives the population of the various districts.

(f) MEDICAL INSTITUTIONS.

NORTH KEDAH.

Hospital, Alor Star	.. .. .	300 beds.
Out-Door Dispensary, Alor Star Town.		
Malay Women and Children Dispensary, Bakar Bata.		
Out-Door Dispensary, Jitra.		
" " Changloon.		
" " Kuala Nerang.		
" " Yen.		

CENTRAL KEDAH.

Hospital, Sungei Patani	.. .. .	285 beds.
" Baling	.. .. .	28 "
Out-Door Dispensary, Sik.		

SOUTH KEDAH.

Hospital, Kulim	.. .. .	200 beds.
Out-Door Dispensary, Bandar Bahru.		

LANGKAWI.

Hospital, Kuah	.. .. .	63 beds.
Out-Door Dispensary, Padang Masirat.		

There is an Out-Door Dispensary at each hospital.

New Out-Door Dispensaries were opened at Jitra on 12-1-1935 (6-10-1353) and at Padang Masirat, Langkawi on 27-11-1935 (1-9-1354).

North, Central and South Districts are each provided with a Motor Travelling Dispensary by which visits are regularly made to schools, villages and Police Stations accessible by roads.

In Langkawi Island the Assistant Surgeon or Dresser visits all villages every month by sea or road distributing medicines, vaccinating, giving injections and inspecting schools.

The map shows the area covered by the said Dispensaries.

All Government servants and coolies under the P.W.D. are regularly examined for symptoms of Tuberculosis.

(g) BUILDINGS.

A ward for the accommodation of Phthisis cases was completed at Alor Star Hospital.

6 additional attendants' quarters were completed at Alor Star Hospital.

An Office for the Lady Medical Officer, Hospital, Alor Star.

4 married dressers' quarters, Hospital, Alor Star and 1 General Ward, Hospital, Alor Star.

2 Malay wards of a new type and 2 additional cells, were completed at the Hospital, Sungei Patani.

II. PUBLIC HEALTH.

A. GENERAL.

Apart from Vital Statistics and general disease control the Health Work of the State may be said to be divisible into four main heads: urban, rural, estates and malarial. The urban and estate sections, in conformity with past years, continued to receive considerable attention.

Two decisions of far-reaching importance to the general public health were taken during the year under review. It was decided to carry out a Health Survey of the State and to undertake a special malarial investigation of Alor Star during the year 1936. Preparations to this end were accordingly undertaken, a laboratory being equipped, personnel selected and trained and some preliminary investigations carried out.

The Health Survey is of special interest in that it is believed that this is the first State in the Malay Peninsula to undertake such a task. As some 85% of the population can be definitely classed as rural and as little is known of the health conditions among them, the value of such a work cannot be over-estimated.

The imperative importance of investigation work and inspecting and laboratory personnel in connection with the anti-malarial work undertaken by the State is sufficiently obvious. The problem is further discussed in the appropriate section. It is gratifying to report recent progress in this connection.

The conditions in urban areas was under detailed review at the end of the year while a detailed survey of health conditions on estates was completed. In view of the increased malarial "epidemic" danger, and the continued prevalence of slump conditions in certain areas this survey is of particular importance. It was discussed in detail by the Kedah Health Board.

The Water Supply of the State received particular attention and their further investigation will form an important part of the Health Survey.

Further particulars of work under the various sections will be found in the following pages.

B. VITAL STATISTICS.

The Mohammadan Calendar being in force upto 1929, and the "Balancing Equation" (Census * Births—Deaths Migrational Surplus) method of population calculation being used instead of the Geometrical for the year under review as per official instruction, rate comparison with the figures given in the 1934 report is only possible with the 1931 Census figure as follows:—

Year	Population Mid-Year	BIRTHS		DEATHS		INFANTILE DEATHS	
		No.	Rate per mille	No.	Rate per mille	No.	Rate per mille
1931 (Census year) ...	433,100	15,615	36.05	9,129	21.1	1,907	122
1935 ...	452,554	16,713	36.93	10,299	22.75	2,469	147.73

Detailed statistics for the year 1935 will be found in the Tables in the appendix attached to this report.

Population.

This year's population figure of 452,554 gives an average yearly increase of 4,864 since the last Census year (1931).

It will be observed that the Malay section of the population is now estimated to comprise some 70% of the total, the Chinese some 17% and the Indian 11% as compared with 67% for the Malays, 18% for the Chinese and 12% for the Indians during 1931 Census period and 70% Malays, 18% Chinese and 10% Indians during the 1921 Census period.

The interesting fact is thus disclosed that the various sections of the population have apparently retained the same relative proportions during the last 25 years. While the Census enumerations have shown a marked improvement in the general sex ratios, from 135 males 100 females in 1921, to 124 males to 100 females in 1931, it is clear that only amongst the Malays can the sex ratios be said to be reasonably satisfactory (1931 Census Malays, practically equal: Chinese, 216 to 100: Indians, 170 to 100).

It was pointed out in last years report that Kulim, Bandar Bahru and Kuala Muda areas were the only ones which did not return a predominantly Malay population. Thus Sungei Patani and Kulim towns continue to be mainly Chinese in character. These places and Alor Star (Table II) are the only towns in the State with a population of over 5,000 although, unfortunately, they are not the only ones to exhibit slum

conditions, a legacy of the past which is being slowly eliminated. A population survey was undertaken in two widely separated areas of the State during the year and this appeared to support the view that the "urban" areas are mainly recruited from the Chinese element, the Malay being mainly kampong and the Indian urban and estate. It is an interesting fact that while over 50% of the Indian community is located on the rubber estate, only some 6% of the Chinese and some 4% of the Malay is to be found similarly situated.

The proportion of immigrational surplus for the period 1st July to 31st December, 1934 is estimated at 8,126, with a deficit of 7,675 for the period 1st June to 30th June, 1935.

Births.

The number of births registered in the State during the year was equal to a crude birth rate of 36.93. Taking into consideration the different methods of population estimation employed, a comparative analysis appears to indicate that the birth rate has varied very little over recent years. Of the births registered during the year, 8,093 were of females and 8,620 of males, comparing with 8,570 male births and 8,193 female births during 1934. The male births again exceeded the female for the three principal races.

It is to be observed that although the Malays again registered almost four times the number of births registered by the Chinese and nearly seven times the number registered by the Indian communities, the Chinese registering almost double the Indian number the rate per mille is highest for the Chinese. (Table III). The 1931 Census figures definitely indicate that total female fecundity is most marked in the Chinese, (Roughly 16: 12: 10 for Chinese: Indian: Malay:), a fact which, in all probability, would be further stressed by only considering the child bearing age periods (figures for which are not available).

Still births were again by far the most prevalent amongst the Malays (Table IV). (76 per cent of total). In general there was 1 still birth to every 19 normal births, as compared with 1 to 17 in 1934.

Deaths.

10,299 deaths were registered during the year giving a crude death rate of 22.75, a rate equal to last year's taking into consideration the new method of population calculation.

Although this rate shows a rise of some 4 per mille over the estimated 1932—the most favourable recent figure,—it is difficult to calculate the exact significance of this in view of the considerable movements of Indian and Chinese labour during the slump period. A study of the figure for the most stable section of the population, the Malay, during this same period shows but little variation. It is suggested that the Malay section of the community in Kedah were far less affected than the rest of the population by the general economic depression.

Gross mortality rates of this nature must always be taken with caution, in any case, as they do not indicate if certain elements are suffering from ill-health. Possibly only now is the effect of the period of economic distress through which the country has passed taking its toll on certain sections of the population. This conclusion appears to be borne out by the fact that the Malay death rate is now the least amongst the races.

There were more male deaths at all age periods except the 5—10 and 25—30 periods, when female deaths predominated. About one quarter of the total deaths were recorded in infancy (under one year), one quarter at the age period 1—20 one quarter at the age period 20—50 and one quarter for 50 years and over. The principal killing diseases among persons of all ages in order of frequency were:—

Diseases.	Approximate percentage of Crude Deaths	
	1935.	1934.
Fever unspecified	42	41
Premature Birth	12	11
Convulsions	10	12
Old age	9	8
Respiratory diseases (excluding T.B.)	7	7
Malaria	4	3

Infantile Mortality.

The crude infantile mortality rate (number of deaths under 1 year of age per 1,000 live births) over the last five years was as follows:—

1931	..	..	..	..	..	122
1932	..	..	..	..	..	120
1933	..	..	..	..	..	141
1934	..	..	..	..	..	148
1935	..	..	..	..	..	148

It will be seen that, here again, the 1932 figure was the most favourable and that there has been a disconcerting rise since that date. That the 1935 figure has not risen in spite of the malarial wave, is a satisfactory feature however.

A study of the mortality at different age periods given above sufficiently indicates how heavy this is in infancy. Almost 50% of the infantile deaths occurred during the first month of life, a fact noted in last year's report.

The principal causes of deaths of infants reported in order of frequency, were:—

Diseases.	Approximate percentage of total infantile deaths.
Premature Birth	48
Convulsions	30
Fever unspecified	10
Pneumonia	4
Diagnosed Malaria	2
Bowel disease	2

The highest rate was again shewn by the Indian Community (226) and the lowest by the Malays (136), the Chinese being (148). The Malay rate has appreciably decreased (143 in 1934) while the Indian has considerably increased (188 in 1934). The Chinese remains the same.

Reference the increased Indian rate, 303 of the 392 deaths recorded apparently occurred from amongst Estate labour in which the infantile death rate rose from 222 to 242 during the last twelve months. Of the Indian infant deaths for the State the principal diseases were as follows:—

Premature Births	180
Convulsions	80
Pneumonia and Bronchitis	39
Fever unspecified	31
Bowel disease	24
Malaria diagnosed	12

Early Deaths.

Early deaths and sickness in early life stand out prominently. Half the deaths in the State apparently took place in 0—20 age period, while 45% of the total deaths were returned for the first 15 years of life. The large amount of ill health which must have occurred coincidentally with these deaths must be a leading cause of indifferent health and permanent physical defect of many of the survivors in their later years, a fact which was borne out by an examination of adults in various areas during the year. The Health Survey of the State to be undertaken in the near future will have, without doubt, an important bearing on further investigations in this respect.

C. PREVALENCE OF, AND CONTROL OVER, COMMUNICABLE DISEASE.

Communicable Disease Generally.

Except in the case of Malaria, no epidemic manifestation was observed during the year under review. Of the major communicable diseases, no Smallpox, Cholera or Plague was reported. Malaria was more widespread than usual but so far the disease appears to have shown little general increase in virulence.

The following table indicates the incidence of reported communicable disease by nationality for the year 1935:—

Infectious Diseases 1935.

Diseases	Malays	Chinese	Indians	Non-Asiatics	Others	Total	
	Deaths	Deaths	Deaths	Deaths	Deaths	Cases	Deaths
* Fever unspecified ...	3,327	671	213	...	108	...	4,319
* Malaria ...	172	134	90	...	11	...	407
* Chicken-pox ...	...	...	...	...	...	57	...
* Enteric ...	21	6	...	...	2	54	29
* Dysentery and diarrhoea ...	53	53	90	...	4	425	200
Influenza ...	25	3	2	...	1	625	31
Diphtheria ...	...	2	...	...	...	3	2
Measles ...	...	...	...	...	...	409	...
Whooping Cough ...	...	...	...	...	...	62	...
* Leprosy ...	1	...	...	...	...	67	1
* Pneumonia ...	24	52	158	...	...	598	234
* Phthisis ...	46	104	46	...	7	218	203
* Puerperal Fever ...	151	37	27	...	5	...	220
Erysipelas ...	...	...	...	...	...	9	5
* Yaws ...	...	...	...	...	...	10	...
Tetanus ...	...	...	...	...	...	1	...

* Specially noted below.

The following diseases call for special mention:—

(I) INSECT—BORNE DISEASE.

(A) MALARIA.

(a) *Malaria in General.*

4,726 deaths or 46% of the total deaths recorded in the State were reported as due to malaria and fevers of undefined origin during the year under review. If convulsions are added, and without doubt many malarial deaths are returned as due to convulsions, this percentage is increased to some 56%. Diagnosed malaria accounted for some 4% of deaths from all causes.

No detail statistical information of the malarial situation in the country generally exists apart from that submitted by Estates. From the latter it is abundantly clear that there was a very considerable increase in the incidence of this disease during the 1934—1935 period, (see next section), a fact borne out by a tendency to an increase of spleen rates in most of the districts as compared with 1934. Spleen inspections on some 4,500 children in various areas of the State varied from 2.74% in Padang Trap (3.00 in 1934) to 24.64% in Yen. (11.20 in 1934). (Such deductions must be taken with caution, however, owing to the small numbers of children examined in each area). A study of breeding places in the controlled areas of the State also showed an increasing tendency to the breeding of dangerous species in places previously free from such risk and consequently merely controlled by watching.

The death statistics show no appreciable increase, however, for the same period as compared with 1934. (1934:— 4504 or 45% of total deaths for malaria and fevers of undefined origin: 56% including convulsions: 3% diagnosed malaria only). While better and earlier treatment has undoubtedly played some part, the conclusion on these figures suggested is that the disease has shewn no increased virulence as yet in Kedah, although far more widespread.

The death rate per mille from possible fever causes among Malays, Chinese and Indians corresponds approximately to 13:13.8 for the whole country. It is hoped that the Health Survey to be undertaken in the new year will throw some light on the incidence of the disease in the general population.

It is quite clear, however, that malaria remains the most important cause of sickness and death in this State.

Thus as foreshadowed in last years report an Anti-Malarial Department was organised during the year. Starting with 2 Collectors for the State at the end of 1934, there are now a Mosquito Dissector, two Inspectors and four Collectors: a malarial laboratory has been equipped and a considerable increase in the malarial work of the Department and its scope in all controlled areas can be recorded.

Proper Anti-Malarial Schemes continued to be confined to Alor Star, Sungei Patani, Kulim and Langkawi. In these however the controlled area was almost doubled during the period under review and the work has now been extended up to the Sanitary Board limits in each case. A half mile radius beyond these limits has been completely surveyed and Government has been requested to gazette the areas as Anti-Malarial Zones.

The considerable malarial problems presented by the very extensive paddy areas around Alor Star (North Kedah), and to a less extent Sungei Patani (Central Kedah) and Langkawi (Island) were given very careful consideration. In the former case, in which the country is flat, such carriers as *A. Barbirostris* and *A. Hyrcanus* predominate: in the latter, *A. Maculatus* in addition. In view of the very considerable sums that it is expected will be required to deal with the problem in any practicable form, a detailed investigation was commenced in the Alor Star area towards the end of the year to ascertain the exact local carrier, its breeding conditions, and the best and cheapest means of control

To stop the *A. Maculatus* breeding in the seepage from the ravine paddy areas in the two latter places, action was taken to extend the cultivation to cover these areas.

The Kulim District (South Kedah) is principally *A. Maculatus* country, being of hilly ravine type. Two outbreaks of malaria had to be dealt with here during the malarial seasons and reported outbreaks were investigated in a number of other places.

Permanent (subsoil) schemes were approved for particularly dangerous areas in the Towns of Kulim and Kuala Nerang. That for the latter was completed. Extensive repairs were carried out on existing subsoil works.

Brush oiling was introduced into certain of the controlled areas as practised in Kuala Lumpur, F.M.S. A considerable saving in oil resulted. This economy measure will be further exploited as better and more intimate supervision is practicable.

Experimentation was also commenced with Paris Green as a larvicide on a large scale, taking into consideration similar work elsewhere as applied to local conditions.

Chemio-prophylaxis was continued at the Quarantine Station, Padang Besar, at Bukit Kayu Hitam and on an increasing number of estates, Atebrin and Plasmochin continuing to be the drugs of choice.

Now that malaria control in the State is being fully organised with trained laboratory and personnel available, supervision by inspection, larval surveys, mosquito dissections and spleen and blood examinations will be increasingly possible. That far more must be attempted and attained in the sphere of malaria control in Kedah is amply borne out even by the statistics available so far. These sufficiently indicate the wide-spread infection prevalent. The consequent ill-health and suffering that must follow to the majority of the population and the grave economic loss to the State are sufficiently obvious factors.

Little has been done so far in Kedah to control mosquito nuisance in residential areas. This problem is one of considerable importance to Sanitary Boards and it is hoped to give it some attention in the future as more important problems permit.

The squatters and temporary house areas are two of the main sources of the trouble: policies with regard to these are already under consideration.

(b) Malaria on Estates.

This section should be read in close conjunction with that on general estate work, where the variations in populations are mentioned.

In 1935, 18,200 cases of malaria and unspecified fever were reported (see Table IX) as compared with 14,045 in 1934. Care was taken during the year to avoid duplicating cases reported from lines and subsequently reported from hospital, a factor which always increased previous figures above the true level as mentioned in last year's report. This factor amounts to approximately 20% and must be remembered right through subsequent comparisons with 1934 figures which are uncorrected. It is evident therefore that the year in question saw a large increase in malaria.

Table X shows in detail that the amount reported was a true increase apart from that caused by an increased population, although the advent of new labour must naturally cause a large increase of infections in that portion.

Taking the European Estate figures only, it will be noted that the case incidence per mille increased to 473.6 representing an increase of almost 4,000 cases. (Population increase 7,000). The malaria death rate per mille rose from 1.9 to 3.2. The hospital admission rate for all fever cases was 47.6%. Only a few estates admit up to 95% of fever cases and this should be the aim of all.

The case fatality for hospital cases remained about 1% but lines fatality rose sharply from 0.076% to 0.27%. This is not a good sign and shows too many cases still treated in lines. This is a bad practice especially in bad malarial years. Malarial deaths as a whole formed 14% of the gross deaths a rise from 9% in 1934. As is usual, also, the total deaths from other causes rose as is common when a malarial wave is in progress.

The figures for Asiatic Holdings must be read with great caution. Apart from a reduction in population of approximately 2,000, there was a considerable reduction in residential labour and much more kampong labour was employed. (See estate section).

The vital statistics of between 30—40% of the population recorded therefore do not appear in these figures, but are absorbed in the general figures for the State. Malay labour also prefers to die and have its children born in its own kampongs and many leave the estate for these events. These factors render the interpretation of the figures available extremely hazardous. It is obvious that the cases of malaria, the hospital admissions and deaths recorded arise from possibly even less than half the population returned. If these be accepted the malarial death rate would be in the neighbourhood of 3 per mille corresponding to that of the European Holdings, although a much smaller malarial incidence is returned. There would appear, however, to be a slight but encouraging increase in the use of the hospital as over 100 more cases were admitted than in 1934 and there were fewer deaths, indicating earlier admission. Indeed the case fatality in hospital was 1.6% compared to 3% in the previous year. Lines fatality rose sharply as on European Holdings from 1.6 to 3.05. For every 1,000 cases returned as occurring on European and Asiatic holdings approximately 3 and 30 die in the lines. There appears to be no reason, therefore, to alter the conclusion found in 1934 that: (a) many cases of malaria from Asiatic holdings are not recorded: (b) while improving, many are still not admitted to hospital: (c) many severe cases refuse to avail themselves of hospital treatment or are not sent to hospital.

In general:—

Malaria is still the main health problem on estates. While it caused one death in seven compared to one in ten in 1934, it helped to raise the general death rate and deaths from other causes to a higher level. It incapacitated 367 persons at least out of every 1,000 during the year. In the general estate section will be found a summary of the work done in estate anti-malarial control.

(B) FILARIASIS.

Observation in the Junun and Gurun districts of the State indicated the prevalence of limb elephantiasis in these areas. An investigation was therefore commenced with reference to the prevalence of this disease in these places. Blood examinations of the coolies on Junun Estate indicated a 14.8% infection rate in those examined (182): further investigation appeared to indicate infection from surrounding kampongs. The investigation is being continued.

(II) EPIDEMIC DISEASE.

(A) *Small-pox and Chicken-pox.*

Although no cases of small-pox were reported during the year, every case of chicken-pox was carefully investigated and the opportunity used for vaccinating purposes as required.

Vaccinations were carried out on estates as follows:—

Year.	No. of persons Vaccinated	No. of tubes used	No. successfully done.	Percentage successful
1933 ...	811	80	667	82
1934 ...	753	111	670	90
1935 ...	574	113	438	74

(B) *Tropical Typhus.*

No cases were reported during 1935 in comparison with three cases with no death in 1934 and nil in 1933. The disease appears to be of little importance in Kedah to date.

(C) *Enteric.*

54 cases of Enteric were reported for the State with 29 deaths. This very high mortality of 54% points unmistakably to the fact that a very large number of milder cases apparently escape all notice.

Some 60% of the cases recorded occurred in Alor Star town and district, an observation which is leading to further enquiry. Every case received the fullest attention and investigation. No epidemic manifestation was observed.

The cases by race were as follows:—

Europeans.	Malays.	Chinese.	Indians.	Others.	Total.
1	17	13	18	5	54

(D) *Dysentery and Diarrhoea.*

The high case mortality of nearly 50% indicates the large number of milder cases which escape notice in this disease also. 1.9% of the total deaths for the State were recorded as due to this cause for the year under review. 22% occurred in children under 1 year of age.

(E) *Leprosy.*

67 cases of Leprosy with one death were reported as compared with 37 and one death for 1934. All contacts were examined with negative results. All cases were segregated.

The cases by race were as follows:—

Malays	Chinese.	Indians.	Others.	Total.
9	35	19	4	67

(F) *Pneumonia.*

The following study of this disease is possible from the returns submitted:—

Year	Deaths	Approximate death rate per mile	Percentage of total deaths
1931 ...	63	0.14	0.7
1932 ...	99	0.23	1.2
1933 ...	130	0.40	1.4
1934 ...	179	0.40	2.
1935 ...	234	0.50	2.3

Estate populations recorded a hospital case mortality of 35% and a death rate of 1.2 per mille as compared with 22.2% and 2.8 for 1934 respectively. These figures mainly concern the Indian community. Of the 234 deaths reported from the State as a whole, 158 (or 67%) came from the Indian community.

(G) *Tuberculosis.*

Year	Deaths	Approximate death rate per mile	Approximate percentage of total deaths
1931	289	0.67	3
1932	289	0.66	3.5
1933	203	0.46	2.2
1934	186	0.40	2
1935	203	0.47	2

Each case reported was followed up and fully investigated. There is little doubt that the true position in regard to this disease is not known as notifications only come from Government and Estate hospitals. The problem will be further investigated during the Health Survey.

The following tables give an indication of the type of the disease by race as recorded over the last three years:—

(a) *Pulmonary Tuberculosis.*

Year	Malays	Chinese	Indians	Others	Total
1933	80	80	36	6	202
1934	64	72	38	6	180
1935	35	77	36	6	154

(b) *Other Forms.*

Year	Malays	Chinese	Indians	Others	Total
1933 ... ..	...	1	...	...	1
1934	3	2	1	...	6
1935	11	27	10	1	49

(H) *Death due to childbirth.*

220 deaths, as compared with 209 for 1934, were recorded as due to this cause. Thus over 2% of the total deaths in the State were maternal deaths.

It is interesting to record that while 19 of these deaths were returned by estates corresponding to 1,396 births or 1 to 73 births, the total for the State gave 1 death to 76 births.

(I) *Yaws.*

As noted in last years report the very small number of yaws cases reported to the Health Office indicate that:—

(a) the disease is rare among estate populations.

(b) the disease is one which is treated outside the hospitals. The treatment is now usually undertaken by the Government Out-door and Travelling Dispensaries.

(J) Convulsions.

This condition continues to take one of the most important and alarming places in the annual returns of deaths, 1,012 or 10% of the total deaths recorded being set down to this cause during the year. Over half of these deaths were in infants under 1 year of age. In view of the fact that the term is the refuge of the ignorant in many cases, this return must be examined with due caution.

(K) Premature Birth.

This condition also figures in an alarming manner in the annual returns being responsible for some 12% of the total deaths in the year under review. Here again there is little doubt that the term covers other conditions.

(L) Cancer.

Year	Deaths	Approximate percentage of total deaths
1932	32	0.40
1933	33	0.35
1934	18	0.20
1935	19	0.20

The statistics available render an accurate survey on the present situation anent this disease an impossibility.

(M) Beri-Beri.

133 deaths, as compared with 263 for 1934, were reported as due to this cause during 1935. Observation has indicated the fact that, apart from these figures, this disease is still of considerable importance in Kedah although no accurate statistical information exists at the moment. The problem will, in consequence be one of those to be reviewed in the Health Survey of the State. Observation on one small outbreak amongst Malay coolies appears to indicate that sudden excessive strain at any time may precipitate an attack in otherwise apparently healthy persons. The relation of the "fasting period" may also be a factor of importance in this respect.

(N) Ankylostomiasis.

Although only 211 deaths were reported as due to this condition, a visit to any kampong will indicate the large number of mild and ambulatory cases prevalent amongst the general population. The majority of sufferers appear to show very few signs of this disease and thus do not seek medical aid. The actual incidence will be one of the objects of the Health Survey as there is little doubt that the disease is widespread.

Quarantine Camp, Padang Besar.

This camp is maintained on the Siamese border and the passengers on all trains entering Perlis and Kedah are examined for signs of the major communicable diseases. None of these were observed during the year under review.

The number of passengers examined was as follows:—

Class	1933	1934	1935
1st class	1,055	1,186	1,299
2nd class	959	1,179	1,675
3rd class	6,949	7,977	10,859
TOTAL	8,963	10,342	13,833

III. HYGIENE AND SANITATION.

Work in the State under this head may be divided into general sections for convenience as follows:—

A. SANITARY BOARD AREAS.

There are nine such districts in the State, namely:— Kota Star, Sungei Patani, Kulim, Jitra, Baling, Bandar Bahru, Yen, Kuala Nerang, and Langkawi. In addition certain areas around these and certain smaller places are gazetted as "Controlled Building Areas." In the former full sanitary control is possible: in the latter only building control.

Considerable attention was paid to the position in the Sanitary Board districts by the Health Department during the year under review in view of the concentration on rural problem proposed by the Health Survey in 1936. Thus, though the policy pursued in previous years was followed and minor improvements effected in many directions, the problem presented is now being considered in its broader aspects, by which procedure it is hoped to effect considerable advance in the near future.

(a) Sewage Disposal.

Two large sewage disposal schemes were commenced in Alor Star and Sungei Patani. These, it is expected, will deal satisfactorily with the European Quarters in these places. In addition, certain smaller schemes for Government buildings in Alor Star were approved. The main method of night soil disposal will still continue to be the dry pail, however, but it is hoped to substitute lorry removal for the present very unsatisfactory hand cartage systems now in use. The pail system was considerably extended in all the larger Sanitary Board Areas.

The Boards also approved the supervision schemes recommended to render the existing methods as satisfactory as possible until lorries are available. Action was taken to standardise the night soil bucket in order to remove the anomalous position at present created by the several types in use.

(b) Refuse Disposal.

A new type of incinerator was erected at Sungei Patani. This appears to be giving satisfaction. Smaller incinerators were also erected in several other Sanitary Board areas. "Controlled tipping" was practised as a temporary measure in Alor Star until it was seen how the new Sungei Patani type functioned. A new public dust bin was designed and approved during the year and it is hoped to introduce this to all the Sanitary Board areas in the near future.

(c) Water Supplies.

Although all the Sanitary Board areas except one are supplied with piped water, the question of improving and extending present supplies was fully considered as:— (i) only one main supply is chlorinated, (ii) general analysis returns continue to give unsatisfactory results, and (iii) only a limited portion of the population is at present dealt with. The water supply problem will form one of the main objects of the Health Survey.

(d) Housing.

The larger Sanitary Boards continued to reduce unsatisfactory conditions in the temporary and permanent slum districts in their areas and in one a definite policy was adopted of demolishing all unsatisfactory temporary houses on a demand for repairs and limiting their further construction to the extra Sanitary Board controlled building zone. It is hoped to extend this policy to the other Sanitary Boards and, in general, to accelerate the cleaning up of the large squatter areas at present in close proximity in all to the permanent house. A type plan for the non-permanent non-Malay house was adopted, while the temporary shop was prohibited.

Removal of the old and insanitary permanent shop house was slowly continued. It is hoped to accelerate action in this direction, to further reduce the number of cubicles without direct access of light and to further improve the "open space" in existing buildings where possible. By such means is the gross overcrowding and insanitary conditions prevalent in certain sections being slowly reduced and new building encouraged.

(e) *Food Control.*

Action was taken to reduce the large numbers of street stalls in Sanitary Board areas, to enforce the bye-laws on those remaining and thus to prevent the existence of the considerable number of large and highly insanitary temporary shops (*i.e.* stalls) found spreading unchecked. The whole question of food control was carefully reviewed and all food manufacturing premises were visited. The question of some universal form of control by the licensing of these and the increasing number of hawkers is now under consideration. Dirty food production and sale is far too common and the menace to the public health entailed cannot be overstressed. The public markets were considerably improved and further progress by extension and improved supervision is impending. The rural market of weekly fairs continued to function popularly under the Agricultural Department and action was commenced to improve their sanitary circumstances.

(f) *Trade premises.*

The small workshop continued to be a health problem and a solution is now being sought by means of licensing control. Steps were taken to prevent the operation of several trades in one premises and to improve labour conditions where possible.

(g) *Drainage.*

Lack of drainage in Alor Star is bound up with the Anti-Malarial problem. Recommendations will follow the special malarial investigation now under way. Drainage improvements have recently been considered by most of the Boards and estimates have been prepared. Necessary improvements will take a considerable time as drainage requirements have not followed building expansion in past years.

(h) *Bye-laws.*

A revision of existing Sanitary Laws is under consideration in view of similar action in other parts of the country. Lack of precise and modern bye-laws is one of the main reasons for the slow improvement at present possible in all Sanitary Board Areas.

(i) *Town Plans.*

A zoning plan was gazetted for Sungei Patani during the year and it is hoped that similar action will be taken by the other large Sanitary Boards in the near future as it is realised that little real progress is to be expected unless a definite policy is laid down and followed in each area.

B. KAMPONG AND RURAL AREAS.

No control and little knowledge of the extra Sanitary Board and Estate area exist at the moment although some 85% of the population is concerned.

Some small and modified rural investigations were carried out during the year. These tended to indicate:— (a), that some 75% of the population still resort to the river, the stream and the shallow well: (b), that in the main such water supplies are open to serious contamination: (c), that intestinal disease is common: (d), that malaria is a main and vitally important factor in some districts but not in others: (e), that such diseases as Beri-beri and Filariasis appear to be confined to specified areas.

C. GOVERNMENT DEPARTMENTS.

The inspection of police stations, cooly lines and other Government quarters was increased during the year. The majority of those visited showed a reasonable sanitary condition and a remarkably low spleen rate. The Travelling Dispensary is mainly responsible for the latter fact.

D. BURIAL GROUNDS.

40 Burial Grounds were inspected during the year and reports submitted to the Land Office.

E. ESTATES.

See Section VI.

IV. PROSECUTIONS.

There were 45 prosecutions under the Labour Code as compared with 17 for 1934. 3 prosecutions were also instituted under the Births and Deaths Enactment.

There were 6 prosecutions and 5 convictions under Section 46 (i) of the Deleterious Drugs Enactment No. 3/1348 and the total amount of fines imposed were \$938.00. The amount of contraband (Cannabis Sativa, Indian Hemp (Bhang)) seized were 59 katties and 3 tahils which were destroyed personally by the Superintendent of Monolies and Customs, Kedah.

V. SCHOOL MEDICAL INSPECTIONS.

Of 86 Malay schools on the visiting list, 38 were inspected during the year as compared with 22 in 1934. Only two now remain which have not been inspected in recent years. These will be the first to be visited in 1936. The most unhealthy school districts of those visited this year appear to be Sinkir (Yen), Bukit Kechil (Kuala Muda), Merbok (Kuala Muda) and Bakai (Baling). The latter is undoubtedly one of the most unhealthy school areas in the State.

27 non-Malay schools were visited at the request of the Registrar of schools.

Table XI (A & B) shows the remediable, preventable disease found in Malay and Non-Malay Schools.

Table XII (A & B) shows a spleen rate comparison by district for 1934 and 1935. *Sanitation.*

Where necessary the attention of the Superintendent of Education was directed to sanitary defects.

School inspection can still be said to be in its infancy in Kedah but the work is being increased year by year.

VI. LABOUR CONDITIONS ON ESTATES (INCLUDING THE MINES, RICE MILLS AND SAGO MILLS).

Tables XIII to XVIII indicate the detailed statistical position for 1935 on all Rubber Estates, Tin Mines, Rice Mills and Sago Mills in Kedah.

Altogether 920 visits were paid to 424 estates, compared to 712 in 1934. Thus 82% of all estates on the visiting list were inspected. Out of a total of 514 on the register at present, 86 are European controlled and 428 under Asiatic management. Each of these groups will be considered separately.

(a) *European Controlled Estates.*

These comprise 85 rubber estates spread over the State and one Wolfram Mine in the Sintok area, all of which were visited. The latter was the subject of a special malarial inquiry in 1934, and since then no fresh trouble has occurred. A visit this year revealed a healthy labour force living at 1,000 feet above sea level under rather unusual conditions both of housing and sanitation. The site is on the flattened top of a ridge in jungle and is inclined to be badly overcrowded. The management, however, pay every attention to the maintenance of healthy conditions as far as is possible.

(i) *Housing.*

Twenty-six new sets of permanent lines were constructed during the year. Twelve of these were of the old back to back type. This plan was withdrawn during the year and, subsequently, 14 single row lines, some in blocks of 4 rooms, have been constructed. 74 lines were repaired. Major recommendations were made on nine estates for line improvements.

(ii) *Water Supplies.*

The following table gives an approximate idea as to how the needs of the estate population on European holdings is being met:—

No. of Estates	Approximate population	Water Supply Conditions
5	3,319	Properly filtered and chlorinated
15	5,525	Piped supply from catchment areas
1	1,446	Jewell Filters and protected wells
6	2,717	Jewell Filters and polluted sources
51	21,801	Protected wells
4	808	Polluted sources
4	Closed	
Total ... 86	36,619	

Thus 6% have a first class water supply.

27% have a good supply.

62% a source of supply safe as long as not contaminated by dirty utensils.

5% a dangerous polluted supply.

Major recommendations for improved water supplies were made on twenty-six estates. Three chlorinated supplies were installed. It is hoped that by the end of 1936 more estates will provide such supplies and that all subject to pollution will have disappeared.

(iii) *Sewage Disposal.*

8 large estates are provided with a septic tank system.

27 adhere to the bucket latrine.

41 have pit latrines and 10 borehole latrines.

Where ground and water supply allow, it is hoped to increase the latter type where a septic tank system is not acceptable. Recommendation anent sewage disposal improvement were made on seven estates.

(iv) *Anti-Malarial Work.*

40 estates practise Anti-larval measures including one on which biological control using cow manure for stream pollution is the rule. 14 estates adhere to the system of chemio-prophylaxis. 10 do no Anti-malarial work and have no endemic malaria in spite of topographical conditions favouring its presence. 18 are situated on land where no measures other than treatment of sporadic cases appear to be indicated for the present. Recommendations were necessary on 12 estates to radically improve anti-larval control measures in use, while five were asked to institute chemio-prophylaxis as anti-larval control had been seriously neglected. There were five outbreaks of malaria needing special attention. It was found necessary to threaten closure to labour on two estates before adequate measures were taken. Two estates suffered from malaria prevalent on adjacent kampong holdings.

(v) *Dresser Staff.*

This aspect of estates work received special attention during the year. As a result of correspondence with managers and recommendations on estates with unqualified men, two estates recruited qualified men, and twelve unqualified dressers sat for the grade (iii) examination. Seven candidates were exempted as the estates in question

do not require a dresser's services. Of those estates with no dresser at the beginning of the year, two now employ qualified men, one will employ one early in 1936, and 15 were exempted or allowed to share. The position can be said to have considerably improved since 1934.

The question of a standard salary scheme for hospital dressers was considered by the Health Board during the year but no decision was reached.

Infectious Disease.

No outbreak of major infectious disease is to be reported but minor epidemics of Measles, Chicken-pox, Whooping cough and Mumps occurred. One outbreak of Amoebic Dysentery resulted from a new batch of coolies from India.

A focus of Filariasis in the Junun area is under investigation.

Sending of Sick to Hospital.

34 hospital deaths and 214 line deaths were investigated during the year. Two estates were warned for undue delay in sending sick to hospital.

Food.

Dietaries in the various Group Hospitals were the subject of a special investigation.

Orders.

No orders were issued during the year.

(b) Asiatic Holdings.

Out of 428 estates on the visiting list, 338 were visited. Action has been taken to see that, apart from small estates not yet on the visiting list, and apart from anti-malarial work, satisfactory conditions of sanitation exist on 90% of these holdings.

During the year orders were recommended and issued for the following:—

1. New lines	..	..	..	..	..	..	41
2. Line repairs	..	..	..	..	..	..	11
3. Latrines	..	..	..	..	..	..	50
4. Wells	..	..	..	..	..	..	38
5. Sanitation	..	..	..	..	..	..	8
6. Demolition of lines	..	..	..	..	..	..	8
7. Anti-Malarial work	..	..	..	..	..	..	6
							<hr/>
						Total	156
							<hr/>

Prosecution was necessary in 45 cases to secure fulfilment.

(i) Anti-Malarial Work.

This is the most difficult part in the control of the small holdings and the inspecting staff was directed to devote close attention to this section of their work. It was found that only twelve estates practised anti-malarial measures. 6 orders were issued during the year, 4 on holdings adjacent to large estate habitation centres whose work was annulled by the breeding of dangerous mosquitoes on the former. Two prosecutions were necessary to get the work done.

Recommendations to commence work was made on 57 estates subject to the acquiescence of the Group Medical Officer where the condition of the labour force indicated its desirability. For economic reasons, it is not possible for the small holder to do field work in many instances, and, for the present, findings are being recorded for later action. A spleen survey on these 57 estates showed an average rate amongst children of 24%.

(ii) *Sending of Sick to Hospital.*

4 hospital deaths and 55 line deaths were the subject of inquiry. Prosecution was undertaken in one case for failure to send sick to hospital.

(c) *Rice Mills and Tin Mines.*

The majority of Rice Mills and all the mines except one were visited during the year

Rice Mill sanitation was found to be much below ordinary estate sanitation. Action was taken to enforce reasonable standards in all instances.

The majority of the Tin Mines in the State are jungle concessions where Chinese search the streams for alluvial tin after damming the stream heads. As they move from stream to stream they erect only very temporary huts and live under the most primitive conditions. They are isolated and a danger to themselves alone. No action appears advisable at the moment. The larger mines conform to reasonable health standards.

(d) *Vital Statistics.*

Tables XIII to XVIII, give detailed statistical information on estate labour. The population of European controlled estates rose by over 7,000 during the year, an increase of 23%, approximately. That on Asiatic holdings fell by over 2,000, a decrease of 20%. An increase in the total population of 19%.

The increase in population on European holdings began at the end of 1934 and was foreshadowed in last year's report.

The decrease on the Asiatic Estates is due to closure of many small holdings.

An attempt was made to get returns from small holdings of the number of labourers employed living in the kampongs. Unfortunately, the resident in charge is often too uneducated to fill in the form correctly. Thus the attempt largely failed. Judging however from the Inspector's reports it would appear that much more kampong labour is now being employed. Possibly only some 50% of the population returned can be called true resident labour on these holdings.

Another factor invalidating returns is the turnover of labour. In the case of European employed, the turnover on any estate is almost entirely absorbed by its neighbours.

On Asiatic holdings the turnover is not from estate to estate but from estate to kampong. It is therefore possible that throughout the year a considerable larger number share the conditions on Asiatic holdings than is indicated by the population figure returned. Thus, it is extremely hazardous to attempt any interpretation of the vital statistics available on these or even to compare them with those of previous years.

Attention is therefore only directed to the returns from European estates. Here the crude death rate rose from 20.2 to 23.6—a rather startling rise—due undoubtedly to influx of new labour and a high malarial incidence. The Indian death rate rose from 21.3—25.7. That for the Malays and Chinese slightly decreased, from 13.6 and 15.2 to 12.7 and 10.3 respectively.

The labourer's death rate amongst Indians also increased from 8.7 to 10.3. There was a large decrease in that of both Malays and Chinese from 5.02 and 19.7 to 1.04 and 6.7 respectively. Too much stress should not be laid on the latter two rates as the numbers concerned are very small and 5 deaths can alter the rate considerably.

Hospital admissions were increased by approximately 5,000 during 1935.

The birth rate rose from 34.7 to 35.4 and the infantile mortality rate from 217.00 to 245. The latter is another indication of the malarial nature of the year.

(e) General.

The foregoing summary only indicates Departmental work in supervision of estate health in part. It is closely allied to, and interwoven, with that of the Kedah Health Board. Thus during the year under review an extensive report was compiled to aid the Board in an investigation on the Medical Supervision of Groups. This reviewed in detail the development of estate health work in Kedah and presented all available statistical data from 1931.

The report brought to light the following interesting facts, amongst others:—

(1) That the estate population of Kedah is only some 10% of the total of the State.

(2) That malaria is by far the most important cause of sickness and loss of working time.

(3) That only some one third of malarial cases go to hospital. (A figure which has risen to half in 1935).

(4) That over 3,000 labourers and their dependents (about 1,250) move about the State from month to month, many of them carriers of malaria parasites.

(5) That both the death rate and the infantile mortality rate for estates are higher than those reported for the State as a whole.

(6) That returns for Asiatic Holdings are largely unreliable.

(7) That Asiatic Holdings do not as a rule send their sick to hospital and those sent are in an unduly advanced condition of the disease concerned.

The report suggested certain lines of development which the Board might pursue, towards furthering the welfare of estate labour, particularly the following:—

(a) Anti-malarial schemes. (Government has since voted \$1,000.00 towards an experimental scheme which is at present being carried out).

(b) Methods of liaison between Group Medical Officers and the Department.

(c) Hospital staffing.

(d) Transportation of sick.

(e) Dressers salary schemes.

(f) Control of the Asiatic Holdings.

It will be seen, therefore, that in 1935 the Health Department gave a large proportion, almost half of its time and staff to the thorough investigation of all aspects of this branch of its work. It is felt that during the next year when the Health Survey is in progress the work on this branch may be greatly reduced especially routine inspection of small holdings.

There is no reason, whatever, if each group employs an adequate anti-malarial staff that any trouble should arise, or malaria, the only real cause for alarm, ever get beyond control.

VII. MATERNITY AND CHILD WELFARE.

During the year there were 220 deaths recorded as due to affections connected with Pregnancy and Child birth or a percentage of 1.32 to total births—a slight increase over last year's figure.

The number of still births recorded were 888 or a percentage of 5.31 to total births.

542 cases under Pregnancy and its Diseases were treated in the various Government hospitals and there were 30 deaths or 5.54% to total treated.

Dr. (Mrs.) M. G. Brodie, Lady Medical Officer, was in charge of the Child Welfare Centre in North Kedah throughout the year.

Out-door cases attended by the Lady Medical Officer.

	New cases	Repetitions	Total
Hospital, Alor Star	731	640	1,371
Town Dispensary, Alor Star	4,132	2,110	6,242
Visits to homes	496	727	1,223
Malay Women and Children Dispensary, Bakar Bata	395	727	1,122
Total	5,754	4,204	9,958

VISITS TO HOMES.

A total of 1,495 visits to homes were made by the Lady Medical Officer—496 new cases and 1,010 repetitions.

OUT-DOOR MATERNITY CASES.

District	Malays	Chinese	Indians	Others	Total
North Kedah	90	4	7	...	101
Central Kedah	4	...	4	1	9
South Kedah	2	...	3	...	5
Langkawi	8	2	...	...	10
Total	104	6	14	1	125

STILL-BIRTHS AND ABORTIONS.

OUT-DOOR CASES.

North Kedah .. ..	..	..	..	..	..	..	3
Central Kedah .. ..	..	..	..	..	..	..	..
South Kedah .. ..	..	..	..	..	..	..	..
Langkawi .. ..	..	..	..	..	..	..	..
							3
						Total ..	3

VIII. HOSPITALS AND DISPENSARIES.

A total of 18,401 patients were treated in all hospitals and prison sick wards. The deaths numbered 799 giving a percentage of 4.34%. 218 deaths occurred within 48 hours of admission; excluding these, the death rate was 3.16%.

The following table gives the number treated, with deaths, for the past six years:—

Year	No. treated	Deaths	Percentage of deaths
1347 A.H.	19,121	1,506	7.87
1930 A.D.	17,800	1,155	6.48
1931 "	12,695	748	5.81
1932 "	12,473	596	4.77
1933 "	13,617	646	4.74
1934 "	14,367	739	5.14
1935 "	18,401	799	4.34

The following table gives the number of cases treated at Out-Door Dispensaries, as well as number of cases treated by the Travelling Dispensaries:—

	New cases	Repetitions	Total
Out-door Dispensary, Hospital, Alor Star ...	8,908	2,032	10,940
" " Alor Star Town ...	14,052	12,858	26,910
" " Changloon ...	2,170	172	2,342
" " Kuala Nerang ...	5,416	347	5,763
" " Yen ...	5,975	2,423	8,398
" " Jitra ...	1,392	115	1,507
Malay Women & Children Dispensary, Bakar Bata	395	727	1,122
Out-door Dispensary, Hospital, Sungei Patani ...	5,494	562	6,056
" " Baling ...	3,040	550	3,590
" " Sik ...	3,082	162	3,244
" " Hospital, Kulim ...	6,881	1,752	8,633
" " Bandar Bahru ...	2,299	76	2,375
" " Hospital, Langkawi ...	2,492	599	3,091
" " Padang Matsirat ...			
Motor Travelling Dispensary, North Kedah ...	9,280	2,724	12,004
" " Central Kedah ...	3,964	678	4,642
" " South Kedah ...	5,630	277	5,907
Travelling Dispensary, Langkawi ...	1,354	...	1,354
Prison, Alor Star ...	1,119	5,232	6,351
" Sungei Patani ...	573	801	1,374
Total ...	83,516	32,087	115,737

The following tables gives the number of Indoor sick treated during the year in the various Hospitals and Prison sick wards:—

Hospital	No. treated	Deaths	Percentage of deaths
Alor Star ...	6,485	254	3.10
Sungei Patani ...	5,943	308	5.18
Kulim ...	4,860	202	4.15
Baling ...	351	14	3.10
Langkawi ...	602	21	3.45
PRISON SICK WARDS.			
Alor Star ...	125	...	...
Sungei Patani ...	35	...	...
Total ...	18,401	799	4.34

NATIONALITIES OF INDOOR PATIENTS.

Nationalities	No. treated	Deaths	Percentage of deaths
Europeans ...	15	...	...
Eurasians ...	9	...	...
Chinese ...	7,670	485	6.32
Indians ...	8,242	242	29.30
Javanese ...	21	3	14.28
Malays ...	2,192	60	4.32
Japanese ...	1	1	100.
Others ...	251	8	3.10
Total ...	18,401	799	4.34

The approximate average daily number of Indoor patients for the year 1935 was:—

Hospital, Alor Star	..	..	..	..	..	295.1
„ Langkawi	..	..	..	..	..	23.3
„ Sungei Patani	..	..	..	..	..	249.0
„ Baling	..	..	..	..	..	17.8
„ Kulim	..	..	..	..	..	192.2
Prison Sick Ward, Alor Star	..	..	..	..	..	8.7
„ Sungei Patani	..	..	..	..	..	Less than 1

The average daily number of Indoor patients in Kedah Government hospitals and Prison Sick Wards for the past 6 years was:—

1347 A.H.	..	..	..	..	..	942.38
1930 A.D.	..	..	..	..	..	881.11
1931 „	..	..	..	..	..	557.86
1932 „	..	..	..	..	..	548.10
1933 „	..	..	..	..	..	678.60
1934 „	..	..	..	..	..	673.10
1935 „	..	..	..	..	..	786.10

PREVAILING DISEASES—SICK INDOOR.

Diseases	1933 A.D.			1934 A.D.			1935 A.D.		
	Cases	Deaths	Deaths %	Cases	Deaths	Deaths %	Cases	Deaths	Deaths %
Malaria ...	2,755	84	3.05	3,239	107	3.30	5,205	131	2.51
Dysentery, Amœbic ...	130	13	10.00	148	15	1.36	211	19	9.00
„ Bacillary ...	64	5	7.81	32	7	21.88	24	2	8.33
Venereal Diseases ...	362	11	3.03	358	...	...	390	1	2.56
Respiratory Diseases (ex. Pulm. Tuberc.)	743	26	3.50	674	28	4.15	885	47	5.31
Pulmonary Tuberculosis ...	353	98	27.76	351	108	30.77	416	137	23.31
Ankylostomiasis ...	661	20	3.02	757	11	1.45	778	27	4.75
Ulcers ...	1,038	1	.09	703	...	...	1,023	2	.19
Wounds & Injuries ...	1,596	23	1.44	1,676	20	1.19	1,689	15	.88
Other Diseases ...	5,915	365	6.00	6,429	443	6.89	7,780	418	5.37
Total ...	13,617	646	4.74	14,367	739	5.14	18,401	799	4.34

MENTAL DISEASES.

Kedah lunatics at the Central Mental Hospital, Tanjong Rambutan, 1935.

Sex	Remained	Admitted	Readmitted	Total	Discharged	Died	Absconded	Repatriated	Remaining	Remarks
Males ...	168	71	...	239	31	15	2	1	190	
Females ...	60	22	...	82	9	3	...	...	70	
Total ...	228	93	...	321	40	18	2	1	260	

LABORATORY AT KEDAH HOSPITALS.

The number of specimens examined during the year was:—

Alor Star	..	..	..	..	..	11,475
Sungei Patani	..	..	..	..	..	18,340
Langkawi	..	..	..	..	..	1,416
Baling	..	..	..	..	..	1,082
Kulim	..	..	..	..	..	7,124
Total						39,437

POST MORTEMS.

The number of post mortems performed during the year was:—

					Medico-legal.	Pathological.
Alor Star	..	..	..	..	49	3
Sungei Patani	..	..	..	..	50	3
Langkawi	..	..	..	..	2	1
Kulim	..	..	..	..	33	7
Baling	..	..	..	..	..	..
Total					134	14

MAJOR OPERATIONS.

The number of major operations performed during the year was:—

Alor Star	..	..	..	..	..	184
Sungei Patani	..	..	..	..	..	75
Kulim	..	..	..	..	..	59
Langkawi	..	..	..	..	..	..
Baling	..	..	..	..	..	..
Total						318

X-RAY EXAMINATIONS.

The X-Ray plant is at the Hospital, Alor Star, where 350 photographs were taken during the year.

VACCINATIONS.

The number of vaccinations done during the year was:—

NORTH KEDAH.

Hospital and District vaccinations	..	..	..	..	4,308
Out-door Dispensary, Alor Star town	..	..	..	..	495
" " Yen	..	..	..	..	1,856
" " Changloon	..	..	..	..	377
" " Kuala Nerang	..	..	..	..	290
Prison sick ward, Alor Star	..	..	..	..	324

CENTRAL KEDAH.

Hospital and District vaccinations, Kuala Muda	..	..	..	..	2,552
" " Baling	..	..	..	..	2,275
Out-door Dispensary, Sik	..	..	..	..	233

SOUTH KEDAH.

Hospital and District vaccinations	..	..	..	..	2,639
Out-door Dispensary, Bandar Bahru	..	..	..	..	83

LANGKAWI.

Hospital and District vaccinations	..	..	..	..	206
Estate vaccinations done by the Health Branch	..	..	..	..	574

Total .. 16,212

N.A.B. INJECTIONS.

	Indoor cases	Out-door cases	Total
Hospital, Alor Star	4,573	1,515	6,088
" Langkawi	107	388	495
" Sungei Patani	1,220	4,105	5,325
" Baling	268	1,120	1,388
" Kulim	173	225	398
Total	6,341	7,353	13,694

PLACES VISITED BY MOTOR TRAVELLING DISPENSARIES.

NORTH KEDAH.

1st Route. Hospital Alor Star; Kapala Batas; Jitra; 16th mile Kodiang Road; Changloon.

2nd Route. Hospital Alor Star; Langgar; Pokok Sena; Naka.

3rd Route. Hospital Alor Star; Telok Kechai; Kuala Kedah; Simpang Ampat; Kota Sarang Semut; Pendang.

CENTRAL KEDAH.

- 1st Route.* Hospital Sungei Patani; Sungei Lalang Police Station; Sungei Lalang Town; Bedong Police Station; Semiling School, Town and Police Station; Gurun quarry, P.W.D. Line, Town, Police Station and School; Guar Chempedak.
- 2nd Route.* Hospital Sungei Patani; Sungei Pasir; Tikam Batu Police Station, Town and School; Rantau Panjang; Kuala Muda P.W.D. Lines, Town, Police Station and School; Bukit Meriam School; Bukit Kechil School.
- 3rd Route.* Hospital Sungei Patani; Kuala Ketil P.W.D. Lines, Police Station, Town and School; Kim Seng P.W.D. Line; Tawar Town; Pulau; Bongor School and Village; Bandar P.W.D. Lines; Weng P.W.D. Lines; Kampongs on roads.

SOUTH KEDAH.

- 1st Route.* Hospital Kulim; Sungei Limau; Lunas; Sungei Sluang Town and School; Matang Durian School; Padang Serai School; Sungei Karangan; Merbau Pulas.
- 2nd Route.* Hospital Kulim, Kelang Lama; Sungei Kob Town and School; Karangan; Pah How; Mahang Town and School.
- 3rd Route.* Hospital Kulim; Kampong 4th mile; Junjong Town and School.
- 4th Route.* Hospital Kulim; Trap Police Station and Town; Sungei Punt; Serdang; Ayer Puteh; Lubok Buntar Town and School; Sungei Kechil; Bandar Bahru; Selama Village.

OFFICIALS.

The following tables gives the Health Statistics of Government Officials, other than Subordinates, in Kedah:—

	European.	Asiatic.
Number of officials resident	63	79
Average number resident	44.43	70.19
Total number on sick list	17	37
Total number of days on sick list	351	389
Average daily number on sick list .. .. .	.05	.09
Percentage of sick to number resident	26.98	46.71
Average number of days on sick list for each patient	20.65	10.51
Average sick time to each resident	5.41	5.81
Total number invalided .. .. .	..	..
Percentage of invalidings to total resident .. .. .	..	..
Total deaths .. .. .	..	2
Percentage of deaths to total resident .. .. .	..	2.53
Percentage of deaths to average number resident .. .. .	..	2.85
Number of cases of sickness contracted away from residence .. .. .	..	..

APPENDICES.

TABLES.

- I. Comparative population figures by race.
- IA. Population by districts.
- II. Approximate, births, deaths and infantile mortality for chief towns in the State of Kedah.
- III. Summary of births and birth rates by race and sex.
- IV. Summary of still-births by race and sex.
- V. Summary of deaths and death rates by race and sex.
- VI. Deaths grouped according to age, sex and nationality.
- VII. Principal causes of death by race.
- VIII. Infantile mortality by race and sex.
- IX. Malarial notifications from Estates, 1930—1935.
- X. Malarial statistics from estates.
- XI. School Inspections.
- XII. Spleen rates by districts among Malays and Non-Malay children, 1934 and 1935.
- XIII. Population by nationality of European and Asiatic holdings.
- XIV. Deaths by nationality on European holdings.
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- XVI. Comparative tables of total estate population showing total deaths and death rates for the years 1934 and 1935.
- XVII. Hospital admissions for 1935.
- XVIII. Birth rates and infantile mortality rates by nationalities on European and Asiatic holdings.
- XIX. Pathological Laboratory figures.
- XX. Return of indoor patients treated in Government hospitals and Prison sick wards.
- XXI. Climatological Summary.
- XXII. Thermometrical and Rainfall observations.

DIAGRAMS AND CHARTS.

1. (a) Births, deaths and infantile mortality rates; 1931—1934.
 (b) Monthly Malarial incidence on estates, 1931—1935.
 (c) Chart showing prevailing diseases among Estate populations-admissions to Government hospitals with deaths.
 (d) Chart showing prevailing diseases among Estate populations-admissions to Group hospitals with deaths.
 (e) Record of Rainfall, 1932—1935.
2. Map of Kedah and Perlis.

TABLE I.

Comparative Population Figures by Race.

Race	CENSUS 1st April, 1921	CENSUS 1st April, 1931	Mid-year 1935
Malays	237,031	286,262	308,073
Chinese	59,403	78,415	79,272
Indians	33,004	50,824	51,016
Non-Asiatics	300	411	435
Others	8,820	13,779	13,758
Total	338,558	429,691	452,554

TABLE IA.

Population by Districts.

						Malays.
Kota Star	..	..	..	..	149,540	75%
Kubang Pasu	..	..	..	..	52,721	80%
Padang Terap	..	..	..	..	11,718	80%
Yen	..	..	..	..	24,441	80%
Kuala Muda	..	..	..	..	71,186	50%
Baling	..	..	..	..	51,055	65%
Kulim	..	..	..	..	53,380	35%
Bandar Bahru	..	..	..	..	27,356	50%
Langkawi	..	..	..	..	11,157	90%
Total					452,554	

TABLE II.

Approximate Population, Births, Deaths and Infantile Mortality for Chief Towns in the State of Kedah, 1935.

Town	Estimated population	Estimated Malay percentage	BIRTHS		DEATHS		INFANTILE DEATHS	
			Number	Rate per mille	Number	Rate per mille	Number	Rate per mille
Alor Star	22,680	40 %	774	34.12	553	24.38	94	121
Sungei Patani	9,610	23 %	480	49.95	417	43.39	78	162.5
Kulim	7,153	25 %	353	49.35	309	43.20	76	215.3

TABLE III.

Summary of Births and Birth Rates by Race and Sex, 1935.

Race				Males	Females	Total	Rate per mille
Malays	...	...	...	5,908	5,509	11,417	37
Chinese	...	...	...	1,698	1,576	3,274	41
Indians	...	...	...	880	861	1,741	34
Non-Asiatics	...	...	...	2	1	3	...
Others	...	...	...	132	146	278	20.9
Total				8,620	8,093	16,713	36.9

TABLE IV.

Summary of Still-Births by Race and Sex, 1935.

Race				Males	Females	Total
Malays	...	...	...	401	280	681
Chinese	...	...	...	48	48	96
Indians	...	...	...	56	41	97
Non-Asiatics	...	...	...	...	...	...
Others	...	...	...	4	10	14
Total				509	379	888

TABLES II AND III.

N.B.—The Non-Asiatic birth figure is of no importance as in every case the mother proceeds to Penang for the event.

TABLE V.

Summary of Deaths and Death Rates by Race and Sex, 1935.

Race				Males	Females	Total	Rate per mille
Malays	...	...	...	3,659	3,150	6,809	22.04
Chinese	...	...	...	1,369	628	1,997	25.02
Indians	...	...	...	674	574	1,248	24.46
Non-Asiatics	...	...	...	...	...	...	...
Others	...	...	...	122	123	245	17.97
Total				5,824	4,475	10,299	22.75

N.B.—The Non-Asiatic death figures are of little value as the majority of these tend to occur outside the State.

TABLE VI.

Deaths Grouped According to Age, Sex and Nationality, 1935.

Deaths by Age Groups				Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others
0	...	...	...	M	...	...	128	442	106	10
				F	...	...	105	268	99	9
4 weeks	...	...	...	M	...	...	53	197	19	5
				F	...	...	46	164	30	5
3 months	...	...	...	M	...	...	51	145	31	3
				F	...	...	27	99	22	4
6 ..	...	...	...	M	...	...	44	135	46	4
				F	...	...	29	98	39	6
1 year	...	...	...	M	...	...	110	487	112	11
				F	...	...	92	434	101	8
5 years	...	...	...	M	...	...	68	200	26	5
				F	...	...	58	234	24	6
10 ..	...	...	...	M	...	...	14	92	13	3
				F	...	...	19	92	7	3
15 ..	...	...	...	M	...	...	12	88	11	1
				F	...	...	15	80	11	3
20 ..	...	...	...	M	...	...	32	128	18	1
				F	...	...	29	101	32	5
25 ..	...	...	...	M	...	...	38	131	38	...
				F	...	...	29	127	57	6
30 ..	...	...	...	M	...	...	55	162	49	5
				F	...	...	34	143	35	16
35 ..	...	...	...	M	...	...	84	121	47	8
				F	...	...	32	114	23	4
40 ..	...	...	...	M	...	...	102	197	37	3
				F	...	...	28	159	22	6
45 ..	...	...	...	M	...	...	105	123	34	6
				F	...	...	18	69	10	7
50 ..	...	...	...	M	...	...	142	189	31	7
				F	...	...	15	147	16	7
55 .. and over	...	...	...	M	...	...	319	836	59	54
				F	...	...	64	807	43	30
TOTAL				...	...	1,997	6,809	1,248	245	

TABLE VII.
Principal Causes of Deaths by Race, 1935.

	Malays	Chinese	Indians	Non-Asiatics	Others	Total
Diphtheria ...	...	2	...	...	...	2
Old age ...	779	109	30	...	14	932
Violence ...	31	24	16	...	2	73
Pregnancy and child birth ...	151	37	27	...	5	220
Premature birth ...	757	202	211	...	19	1,189
Malaria ...	172	134	90	...	11	407
Enteric ...	21	6	...	...	2	25
Dysentery and Diarrhoea ...	53	53	90	...	4	200
Influenza ...	25	3	2	...	1	31
Tuberculosis (Pulm.) ...	35	77	36	...	6	154
Tuberculosis (Others) ...	11	27	10	...	1	49
Leprosy ...	1	...	...	...	...	1
Syphilis ...	5	17	9	...	1	32
Ankylostomiasis ...	165	26	13	...	7	211
Fever Unspecified ...	3,327	671	213	...	108	4,319
Cancer ...	7	9	3	...	...	15
Beri-beri ...	89	36	1	...	7	133
Heart and Circulation ...	45	71	59	...	10	185
Other lung diseases ...	227	100	84	...	22	433
Pneumonia ...	24	52	158	...	...	234
Convulsions ...	712	188	99	...	13	1,012
Other causes ...	172	155	97	...	12	436
Total ...	6,809	1,997	1,248	...	245	10,299

TABLE VIII.
Infantile Mortality by Race and Sex, 1935.

Race	Males	Females	Total	Rate per mille
Malays ...	919	629	1,548	136
Chinese ...	276	207	483	147
Indians ...	202	190	392	225
Non-Asiatics ...	...	...	...	...
Others ...	25	21	46	165
Total ...	1,422	1,047	2,469	148

TABLE IX.
Malarial Notification from Estates, 1930—1935.

Year	Reported to have occurred in		Total
	Hospitals	Lines	
1930 ...	3,442	16,495	19,937
1931 ...	3,229	9,600	12,829
1932 ...	2,917	7,891	10,808
1933 ...	4,894	9,484	14,378
1934 ...	4,846	9,199	14,045
1935 ...	8,629	9,571	18,200

TABLE X.

Malarial statistics from Estates.

Holding.	Population.	Cases notified.		Total.	Malarial deaths.		Total.	Total deaths.		Total.	Percentage cases admitted to Hospital.	Case incidence per mille.	Case fatality percent.			Percentage malarial deaths of total deaths.			Malarial death rate per mille.
		Hospitals.	Lanes.		Hospitals.	Lanes.		Hospitals.	Lanes.				Hospital.	Lanes.	Total.	Hospital.	Lanes.	Total.	
Europeans	36,619	8,264	9,080	17,344	93	25	118	642	222	864	47.6	473.6	1.1	0.27	0.68	14.5	11.3	13.7	3.2
Asiatic ...	12,901	365	491	856	6	15	21	36	51	87	41.4	66.6	1.6	3.05	2.4	16.6	29.4	24.1	1.6
Total ...	49,520	8,629	9,571	18,200	99	40	139	678	273	951	47.4	367.5	1.1	0.4	0.71	14.6	14.6	14.6	2.8

TABLE XI.

A.

SCHOOL INSPECTION.

Malay.

Number of children on the registers	..	..	..	4,811
" " inspected	..	..	..	4,148

Diseases	No. of Cases	Percentage
Spleen	319	7.69
Anæmia	81	1.95
Not vaccinated	121	2.92
Eye diseases	11	.25
Ear diseases	17	.42
Scabies	274	6.61
Other skin diseases	16	.39
Yaws	13	.32
Caries class I	491	11.84
" " II	457	11.02
" " III	593	14.30

B.

NON-GOVERNMENT SCHOOLS.

Number of children on the registers	..	..	..	589
" " inspected	..	..	..	390

Diseases	No. of Cases	Percentage
Spleen	20	5.13
Anæmia	4	1.03
Not vaccinated	16	4.10
Eye diseases	5	1.28
Ear diseases	..	..
Scabies	22	5.64
Other skin diseases	..	..
Yaws	..	..
Caries class I	29	7.44
" " II	39	10.00
Caries " III	86	22.05

TABLE XII.

Spleen Rates by Districts among Malays and Non-Malay Children, 1934 and 1935

(a) Malays.

District	Examined		Enlarged spleens		Spleen rate	
	1934	1935	1934	1935	1934	1935
Kubang Pasu ...	234	264	11	19	4.07	7.20
Padang Terap ...	94	73	28	2	3.00	2.74
Kota Star ...	623	1,641	45	92	7.20	5.61
Baling ...	625	411	30	63	4.80	15.33
Kulim ...	81	217	1	10	1.20	4.61
Kuala Muda ...	809	681	50	99	6.20	14.54
Bandar Bharu ...	...	289	...	19	...	6.57
Yen ...	143	138	16	34	11.20	24.64
Langkawi ...	...	434	...	22	...	5.07

(b) Non-Malay (Chinese and Others) Children.

District	Examined		Enlarged spleens		Spleen rate	
	1934	1935	1934	1935	1934	1935
Kubang Pasu ...	57	26	3	3	5.20	11.54
Padang Terap... ..	...	...	...	...	...	...
Kota Star ...	154	62	2	7	1.30	11.29
Baling ...	72	20	2	3	2.70	15.00
Kulim ...	346	76	4	5	1.10	6.58
Kuala Muda ...	376	51	12	1	3.10	1.96
Bandar Bahru ...	158	35	4	1	2.50	2.86
Yen ...	49	48	2	...	4.10	...
Langkawi ...	...	54	...	...	...	...

TABLE XIII.

ESTATE FIGURES FOR 1935.

(a) Population by nationality of European holdings.

Nationalities	Labourers		Dependants		Infants	G. Total
	Male	Female	Adults	Children		
Malays ...	1,858	1,017	212	753	162	4,002
Indians ...	14,226	6,573	2,199	6,877	1,063	30,938
Chinese ...	1,151	38	184	159	12	1,544
Javanese ...	27	4	4	4	1	40
Others ...	30	...	42	16	7	95
Total ...	17,292	7,632	2,641	7,809	1,245	36,619

(b) Population by nationality of Asiatic holdings.

Nationalities	Labourers		Dependents		Infants	Total
	Male	Female	Adults	Children		
Malays	3,185	2,456	185	1,229	167	7,222
Indians	1,257	376	128	379	39	2,179
Chinese	2,400	229	244	384	76	3,333
Javanese	27	21	1	12	2	63
Others	85	2	8	8	1	104
Total	6,954	3,084	566	2,012	285	12,901

TABLE XIV.

(a) Deaths by nationality on European holdings.

Nationalities	Labourers	Dependents		Infants	Total
		Adults	Children		
Malays	2	8	19	20	49
Indians	13	31	27	96	167
Chinese	4	...	1	1	6
Javanese ... ..	...	...	...	...	...
Others ... ..	...	...	...	...	...
Total	19	39	47	117	222

Still births 6 Indians

(b) Deaths by nationality in Group Hospitals from European holdings.

Nationalities	Labourers	Dependents		Infants	Total
		Adults	Children		
Malays	1	...	...	4	2
Indians	174	81	136	196	587
Chinese	3	4	...	2	9
Javanese ... ..	...	...	...	...	...
Others ... ..	...	...	...	...	...
Total	178	85	136	199	598

Still birth 1 Indian

(c) Deaths by nationality in Government Hospitals from European holdings.

Nationalities	Labourers	Dependents		Infants	Total deaths
		Adults	Children		
Malays ... ..	...	...	...	...	...
Indians	28	2	10	2	42
Chinese	1	...	...	...	1
Javanese ... ..	...	...	...	...	...
Others ... ..	...	...	...	...	...
Total	29	2	10	2	43

TABLE XIV.

(d) Deaths Rate by nationality from European holdings.

Nationalities				Total population	Total deaths	Death rates
Malays	...	...	...	4,002	51	12.7
Indians	...	...	...	30,938	796	25.7
Chinese	...	...	...	1,544	16	10.3
Javanese	...	...	...	40	...	...
Others	...	...	...	95	...	...
Total				36,619	863	23.6

(e) Labourers death rates by nationality from European holdings.

Nationalities				Total population	Total deaths	Death rates
Malays	...	...	...	2,875	3	1.04
Indians	...	...	...	20,799	215	10.3
Chinese	...	...	...	1,189	8	6.7
Javanese	...	...	...	31	...	...
Others	...	...	...	30	...	...
Total				24,924	226	9.06

TABLE XV.

(a) Deaths by nationality from Asiatic holdings.

Nationalities				Labourers	Dependents		Infants	Total deaths
					Adults	Children		
Malays	...	...	12	5	8	9	34
Indians	...	...	2	2	2	5	11
Chinese	...	...	...	3	1	2	6
Javanese	...	...	...	...	...	...	...
Others	...	...	...	...	...	...	...
Total				14	10	11	16	51

Still births 2 Malays, 1 Indian, 1 Chinese.

(b) Deaths by nationality in Group Hospital from Asiatic holdings.

Nationalities				Labourers	Dependents		Infants	Total
					Adults	Children		
Malays	...	...	1	1	...	...	2
Indians	...	...	5	5	3	4	17
Chinese	...	...	7	3	2	1	13
Javanese	...	...	...	...	...	...	...
Others	...	...	...	...	...	...	...
Total				13	9	5	3	32

(c) There were 2 Indians and 2 Chinese Labourers Deaths recorded in Government Hospitals for Asiatic holdings.

(d) Death Rates by nationality from Asiatic holdings.

Nationalities				Population	Deaths	Death rates
Malays	...	...	...	7,222	36	4.98
Indians	...	...	...	2,179	30	13.08
Chinese	...	...	...	3,333	21	6.03
Javanese	...	...	...	63	...	...
Others	...	...	...	104	...	...
Total				12,901	87	6.07

TABLE XV.

(e) Labourers Death Rates by nationalities from Asiatic holdings.

Nationalities				Population	Deaths	Death rates
Malays	...	...	...	5,641	13	2.3
Indians	...	...	...	1,633	9	5.5
Chinese	...	...	...	2,629	9	3.4
Javanese	...	...	...	48	...	...
Others	...	...	...	87	...	...
Total				10,038	31	3.1

TABLE XVI.

Comparative Tables for total Estate population showing total Deaths and Death Rates for the years 1934 and 1935.

(a) 1934.

No.	Class of holdings	Population	Deaths in lines	Deaths in Hospitals		Total Deaths	Death rate	Total death rate
				Govt.	Group			
1	European owned	29,335	168	34	390	592	20.2	...
2	Native owned	14,960	61	1	36	98	6.5	...
Total		44,295	229	35 426 461		690	...	15.5

(b) 1935.

No.	Class of holdings	Population	Deaths in lines	Deaths in Hospitals		Total Deaths	Death rate	Total death rate
				Govt.	Group			
1	European owned	36,619	222	43	598	863	23.6	...
2	Native owned	12,901	51	4	32	87	6.7	...
Total		49,520	273	47 630 677		950	...	19.2

TABLE XVII.

Hospital Admissions for 1935.

Class of Estates			Government	Group	Total
European Owned	...	...	573	19,722	20,295
Asiatic Owned	...	...	50	924	974
Total			623	20,646	21,268

TABLE XVIII.

(b) Birth rates and infantile mortality rates by nationalities on European Estates.

Nationalities				Population	Births	Birth rate	Infantile deaths	Infantile mortality rate
Malays	...	...	...	4,002	59	14.7	21	355.9
Indians	...	...	...	30,938	1,224	39.6	294	240.2
Chinese	...	...	...	1,544	13	8.4	3	230.8
Javanese	...	...	...	40	...	...	...	...
Others	...	...	...	95	...	...	...	...
Total				36,619	1,296	35.4	318	245.4

(b) Asiatic Estates.

Nationalities				Population	Births	Birth rate	Infantile deaths	Infantile mortality rate
Malays	...	...	...	7,222	52	7.2	9	174.06
Indians	...	...	...	2,179	27	12.4	9	333.03
Chinese	...	...	...	3,333	21	6.3	3	142.08
Javanese	...	...	...	63	...	...	...	...
Others	...	...	...	104	...	...	...	...
Total				12,901	100	7.7	21	210

TABLE XIX.

GOVERNMENT PATHOLOGICAL LABORATORY.

The total number of specimens examined in 1935 amounted to 7,849 and compares favourably with that of 1934 which amounted to 8,082. In 1932 the number of tests carried out were 1,174. This figure rose to 4,587 in 1933. This was partly due to the larger amount of samples sent in by the Group Hospitals. During the whole of 1934 the Group Hospitals sent 905 samples while in 1935 the number amounted to 899.

It will be noted that the use of laboratory is being more extended, and it is expected that 1936 will see an even greater augmentation of the work.

The following is a brief outline of the work done in the Government Pathological Laboratory during 1935.

Wassermann Reactions (Blood)	2,963
Kahn Reactions (Blood)	2,963
Widal Reactions	252
Weil Felix	36
C.S.F. for Culture	6
Blood for Culture	20
Pus for Culture	2
Urine for Culture	64
Stool for Culture	150
Naso-pharyngeal Swabs	17
Throat Swabs	84
Nasal Swabs	4
Ear Swabs	4
Vaginal Smears	4
Preparation of Vaccines	33
Uterine discharge for culture	1
Urethral smears	11
Blood smears	704
Pus for examination	3
Sputum for examination	5
Stool for analysis	26
Ascitic fluid	1
Pleural exudate	1
Dandruff for spores	1
Water samples	95
Aerated Water samples	12
Animal experiments	11
Reticulocyte Count	2
Blood Iron	20
Estimation of Haemoglobin	20
White Blood Cell Count	5
Red Blood Cell Count	16
Differential leucocyte Count	5
Red Cell fragility	1
Histological examination	41
Examination of foetus	1
Urine for Chemical examination	40
Estimation of Urea in Urine	2
Examination of Gastric Contents	11
Estimation of blood calcium	3
Blood Sugar	7
Blood Urea	8
Van den Berg's test	1
Police Exhibits for human blood	159
" " semen	32
" " hair	2
	<hr/>
Total	7,849
	<hr/>

Of this total 899 tests were carried out for the Group Hospitals as follows:—

Wassermann Reactions	..	..	..	..	..	413
Kahn Reactions	..	..	..	..	..	413
Vidal Reactions	..	..	..	..	..	47
Urine for Culture	..	..	..	..	..	4
Stool for Culture	..	..	..	..	..	3
Tissue for isolation of B. tetani	..	..	..	..	..	1
Blood Culture	..	..	..	..	..	7
Preparation of Vaccine	..	..	..	..	..	1
Water Sample	..	..	..	..	..	7
Histological Examination	..	..	..	..	..	2
Ascitic fluid ..	..	..	..	..	..	1
						—
					Total	899
						—

TABLE XX.

ANNUAL RETURN OF INDOOR PATIENTS, TREATED IN HOSPITALS
AND PRISON SICK WARDS IN KEDAH, DURING 1935 A. D.

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
INFECTIVE DISEASES.						
Cerebrospinal fever	...	1	1	1	...	
Chicken-pox	...	21	...	21	...	
Dengue	...	1	...	1	...	
Diphtheria	...	6	2	6	...	
Dysentery Amoebic	5	206	19	211	9	
" Bacillary	1	23	2	24	3	
Enteric Fever	...	38	7	38	4	
Erysipelas	...	5	...	5	...	
Gonorrhœa	16	317	...	333	10	
Gonorrhœal Rheumatism	...	43	1	43	4	
Gonorrhœal Conjunctivitis	1	13	...	14	...	
Influenza	1	122	...	123	2	
Leprosy	4	79	...	83	4	
Malaria :—						
(a) Benign Tertian	66	2,521	43	2,587	47	
(b) Quartan	5	112	2	117	1	
(c) Malignant Tertian	30	1,316	70	1,346	36	
(d) Mixed Infection	...	42	6	42	2	
(e) Type Undiagnosed	12	718	6	730	41	
(f) Malarial Cachexia	5	378	4	383	25	
(g) Blackwater Fever	...	...	...	...	...
Measles	1	26	...	27	...	
Mumps	...	25	...	25	...	
Phagedæna	...	...	...	...	...
Pneumonia	9	174	78	183	4	
Pyæmia	1	2	...	3	1	
Pyrexia of uncertain origin	4	150	2	154	6	
Rheumatism	5	67	...	72	4	
Septicæmia	...	20	16	20	1	
Syphilis :—						
(a) Primary	5	170	...	175	9	
(b) Secondary	57	243	10	300	19	
(c) Inherited	7	95	3	102	8	
(d) Tertiary	...	42	6	42	10	
Tetanus :—	...	6	5	6	...	
Tuberculosis :—						
(a) General	5	18	2	23	3	
(b) Phthisis	32	361	135	393	60	
Whooping Cough	...	8	...	8	...	
Yaws	...	41	...	41	1	
Other Infective Diseases	...	9	...	9	...	
INTOXICATIONS.						
Alcoholism	...	25	...	25	...	
Morphinism	3	40	...	43	5	
Opium habit	...	193	...	193	...	
Other intoxications	...	18	...	18	...	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
GENERAL DISEASES.						
Anæmia	1	84	6	85	5	
Beri-beri	4	35	5	39	7	
Diabetes ... ..	...	4	1	4	...	
Gout	1	...	...	1	...	
Debility	1	...	...	1	...	
Toxæmia ... ..	...	...	...	...	...
Osteo-arthritis ... ..	...	...	...	...	...
Other General Diseases ...	6	55	30	61	8	
CERTAIN MORBID CONDITIONS INCIDENT TO VARIOUS PARTS.						
Malformations ... ..	...	3	1	3	1	
Imperforate Anus ... ..	...	...	...	...	...
New Growth, Non-malignant ...	...	23	2	23	2	
Do. Malignant	2	51	20	53	1	
Cyst	1	21	...	22	...	
Other Morbid Conditions ...	...	7	...	7	...	
DISEASES OF THE NERVOUS SYSTEM.						
Nerves :—						
Neuritis	12	64	...	76	12	
Multiple Neuritis	2	6	...	8	1	
Other Diseases of the Nerves... ..	3	20	...	23	...	
Meningitis ... ..	...	...	...	...	...
Spinal Cord and Membranes :—						
Myelitis	1	1	...	2	...	
Locomotor ataxia	4	1	1	5	1	
Other Diseases of the Spinal Cord and Membranes	2	8	1	10	1	
Brain and Membranes :—						
Meningitis ... ..	...	1	1	1	...	
Hæmorrhage ... ..	...	4	4	4	1	
Abscess	5	2	2	7	...	
Hydrocephalus ... ..	...	2	2	2	...	
Other Diseases of Brain and Membranes ... ..	...	3	1	3	...	
Nervous Disorders :—						
Apoplexy ... ..	...	2	2	2	...	
Paraplegia	4	4	1	8	...	
Hemiplegia	6	25	8	31	10	
Chorea ... ..	...	1	...	1	...	
Convulsions ... ..	...	8	5	8	3	
Epilapsy	4	23	2	27	...	
Neuralgia ... ..	...	11	...	11	...	
Hysteria ... ..	...	2	...	2	...	
Neurasthenia ... ..	...	1	...	1	1	
Other Nervous Disorders ...	5	24	...	29	1	
Mental Diseases :—						
Idiocy ... ..	...	...	...	...	...
Mania	1	39	1	40	8	
Melancholia ... ..	...	...	...	...	...
Dementia ... ..	...	...	...	...	...
Other Mental Diseases ...	10	108	...	118	7	
DISEASES OF THE EYE.						
Conjunctivitis	3	117	...	120	3	
Trachoma	1	14	...	15	...	
Keratitis ... ..	...	8	...	8	...	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
DISEASES OF THE EYE.—Contd.						
Ulcer of Cornea	4	22	...	26	3	
Iritis ... ..	...	11	...	11	1	
Glaucoma ... ..	...	...	...	...	...
Hypopyon ... ..	...	1	...	1	...	
Optic atrophy ... ..	...	1	...	1	...	
Cataract	5	17	...	22	3	
Pterygium	1	...	...	1	...	
Panophthalmitis ... ..	...	4	...	4	...	
Blindness	2	2	...	4	...	
Errors in refraction ... ..	...	...	...	...	...
Entropion ... ..	...	1	...	1	...	
Other Eye Diseases	13	21	...	34	19	
DISEASES OF THE EAR.						
Inflammation ... ..	...	2	...	2	...	
Other Ear Diseases ... ..	...	24	1	24	1	
DISEASES OF THE NOSE.						
Inflammation ... ..	...	2	...	2	1	
Other Nose Diseases ... ..	...	7	...	7	...	
DISEASES OF THE CIRCULATORY SYSTEM.						
Pericarditis ... ..	...	4	2	4	...	
Endocarditis ... ..	...	2	...	2	...	
Valvular Disease	2	95	35	97	8	
Myocarditis	3	23	6	26	4	
Dilatation of Heart	2	...	...	2	...	
Syncope ... ..	...	5	5	5	...	
Disordered action of Heart	8	1	...	9	...	
Aneurysm ... ..	...	3	...	3	...	
Auricular fibrillation ... ..	...	...	...	...	...
Phlebitis ... ..	...	3	1	3	...	
Thrombosis ... ..	...	1	...	1	...	
Aortic regurgitation ... ..	...	...	...	...	...
Varix ... ..	...	4	...	4	...	
Other Diseases of the System	6	29	4	35	3	
DISEASES OF THE RESPIRATORY SYSTEM.						
Asthma	3	213	1	216	11	
Coryza ... ..	...	...	...	...	...
Laryngitis ... ..	...	2	...	2	1	
Bronchitis	14	500	8	514	35	
Broncho-pneumonia	2	60	29	62	3	
Pleurisy	3	25	6	28	2	
Empyema ... ..	...	4	2	4	1	
Other Diseases of the System	2	57	1	59	4	
DISEASES OF THE DIGESTIVE SYSTEM.						
Stomatitis ... ..	...	8	...	8	...	
Pyorrhœa alveolaris ... ..	...	9	...	9	...	
Caries of tooth ... ..	...	23	...	23	...	
Tonsillitis ... ..	...	20	...	20	...	
Inflammation of pharynx ... ..	...	8	...	8	...	
Gastritis	2	51	...	53	2	
Ulceration of stomach	3	48	3	51	4	
Dyspepsia ... ..	...	68	...	68	2	
Enteritis	5	85	15	90	3	
Appendicitis	1	22	3	23	1	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
DISEASES OF THE DIGESTIVE SYSTEM—(Contd.)						
Colitis ...	...	3	...	3	...	
Ulceration of intestines ...	1	10	3	11	...	
Sprue ...	...	4	...	4	1	
Hernia ...	3	41	3	44	...	
Intestinal obstruction ...	1	7	2	8	...	
Diarrhœa ...	9	94	4	103	...	
Constipation ...	...	45	...	45	...	
Colic ...	...	39	...	39	3	
Ischio-rectal abscess ...	...	5	...	5	...	
Ulcer of anus ...	...	10	...	10	...	
Fissure of anus ...	...	4	...	4	...	
Fistula in ano ...	1	12	1	13	1	
Hemorrhoids ...	1	42	...	43	3	
Hepatitis ...	1	27	1	28	3	
Abscess of liver ...	...	4	6	4	...	
Cirrhosis of liver ...	3	26	1	59	2	
Congestion of liver ...	...	...	2	...	1	
Jaundice ...	1	18	...	19	1	
Gall stones ...	...	1	1	1	...	
Peritonitis ...	...	4	2	4	...	
Ascites of unknown origin ...	...	1	...	1	1	
Other diseases of the System ...	3	51	12	54	1	
DISEASES OF THE LYMPHATIC SYSTEM.						
Spleen, inflammation ...	1	1	...	2	1	
Spleen rupture ...	...	1	1	1	...	
Bubo ...	7	90	...	97	7	
Suppuration of Glands ...	...	1	...	1	1	
Lymphangitis ...	...	2	...	2	...	
Other Diseases of the System ...	1	16	...	17	...	
DISEASES OF THE THYROID BODY						
... ..	...	1	...	1	...	
DISEASES OF THE URINARY SYSTEM.						
Acute nephritis ...	6	56	15	62	2	
Bright's disease ...	2	35	8	37	3	
Bacilluria ...	1	...	...	1	...	
Cystitis ...	...	13	...	13	...	
Calculus ...	...	5	...	5	...	
Retention of urine ...	...	11	...	11	1	
Incontinence of urine ...	...	...	...	...	...
Other diseases of the System ...	1	34	4	35	3	
DISEASES OF THE GENERATIVE SYSTEM.						
<i>Male :—</i>						
Stricture ...	1	22	1	23	...	
Urethral fistula ...	...	3	...	3	...	
Phimosis ...	1	16	...	17	...	
Ulcer Penis ...	2	9	...	11	...	
Soft chancre ...	1	21	...	22	2	
Scrotum, Abscess ...	...	1	...	1	...	
Hydrocele ...	...	13	...	13	1	
Orchitis ...	1	13	...	14	...	
Epididymitis ...	2	14	...	16	...	
Other diseases, Male Organs ...	...	9	...	9	2	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
DISEASES OF THE GENERATIVE SYSTEM—(Contd.)						
<i>Female :—</i>						
Metritis	1	5	...	5	...	
Erosion of cervix ... ..	...	12	...	13	...	
Displacements and distortions ... ..	...	4	1	4	...	
Vulva, Inflammation ... ..	...	10	...	10	...	
do. Soft chancre	1	1	...	1	...	
Other diseases, Female Organs...	...	28	2	29	2	
AFFECTIONS CONNECTED WITH PREGNANCY AND PARTURITION.						
Natural labour	10	333	...	343	3	
Difficult labour	1	25	6	26	...	
Abortion	2	27	...	29	...	
Papture perineum ... ..	...	1	...	1	...	
Retention of placenta ... ..	...	3	1	3	...	
Premature birth ... ..	...	23	14	23	...	
Post-partum hæmorrhage ... ..	...	1	...	1	...	
Puerperal sapræmia ... ..	...	6	3	6	...	
Other affections	1	107	6	108	7	
DISEASES OF THE FEMALE BREAST						
	...	2	...	2	...	
DISEASES OF THE BONES AND ORGANS OF LOCOMOTION.						
Periostitis ... ..	...	4	...	4	1	
Caries of bones ... ..	...	4	...	4	...	
Lumbago	1	...	...	1	...	
Necrosis of bones ... ..	...	9	...	9	1	
Arthritis	4	74	...	78	3	
Synovitis ... ..	...	15	...	15	1	
Caries of spine ... ..	...	1	...	1	...	
Myalgia	1	45	...	46	...	
Other diseases of the Bones and Organs of Locomotion	2	35	...	37	4	
DISEASES OF THE CONNECTIVE TISSUE.						
Cellulitis	4	51	1	55	3	
Abscess	5	275	1	280	16	
Gangrene	2	10	8	12	1	
Oedema	1	...	...	1	...	
Other Diseases of the Connective Tissue	2	35	...	37	3	
DISEASES OF THE SKIN.						
Urticaria	1	2	...	3	1	
Eczema	3	59	...	62	1	
Boil	1	8	...	9	...	
Carbuncle ... ..	...	4	...	4	...	
Herpes ... ..	...	8	...	8	...	
Herpes Zoster ... ..	...	8	...	8	...	
Psoriasis ... ..	...	3	...	3	...	
Ulcer	28	995	2	1,023	54	
Other Skin Diseases	2	51	...	53	1	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
INJURIES.						
General ...	...	11	...	11	2	
Burns and scalds ...	...	20	...	30	...	
Wounds ...	21	1,051	3	1,072	23	
Sprains ...	...	25	...	25	...	
Fractures, Simple ...	13	96	5	109	10	
do. Compound ...	1	48	6	49	...	
Dislocations ...	...	9	...	9	...	
Other local injuries ...	13	349	1	362	5	
Dog bite ...	1	22	...	23	1	
Snake bite ...	2	7	...	9	1	
POISONS.						
Opium ...	1	...	...	1	...	
PARASITES.						
Ascaris Lumbricoides ...	21	645	2	666	18	
Ankylostomiasis ...	27	751	27	778	42	
Oxyuris Vermicularis ...	...	1	...	1	...	
Filaria ...	...	8	...	8	...	
Tinea Tonsurans ...	...	15	...	15	...	
„ Imbricata ...	1	12	...	13	2	
Scabies ...	1	136	...	137	2	
Ringworm ...	1	...	...	1	...	
Other Animal Parasites ...	1	35	...	36	5	
OLD AGE.						
Senility ...	2	4	3	6	2	
UNDER OBSERVATION ...	28	764	...	792	42	
NO DISCOVERABLE DISEASE ...	2	613	2	615	20	
TOTAL ...	695	17,706	799	18,401	651	

TABLE XXI.

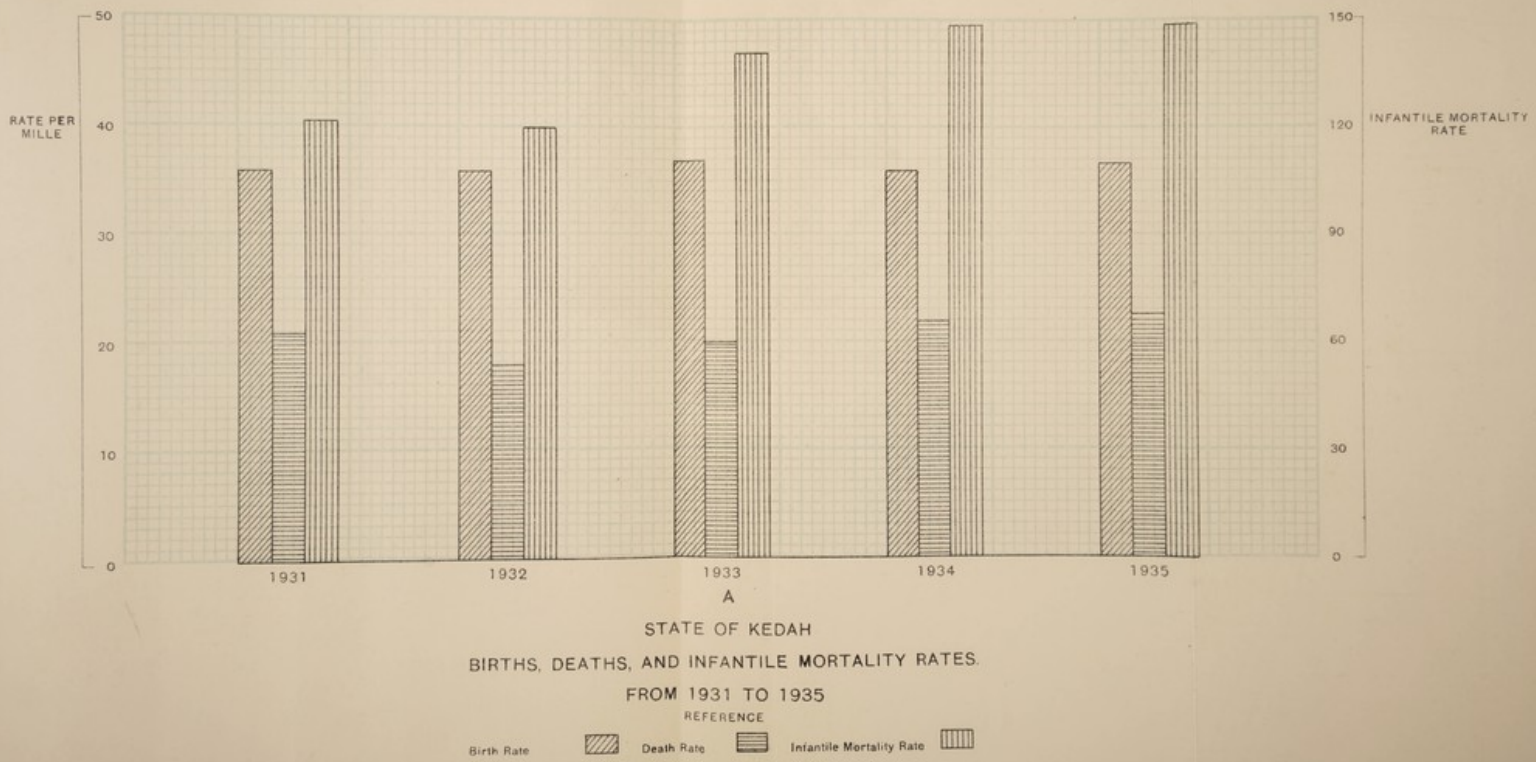
CLIMATOLOGICAL SUMMARY.

Station—ALOR STAR, KEDAH.
 Lat. 6° 09' N.
 Long. 100° 12' E.

Height above M.S.L. 10 Ft.

Year 1935	AIR TEMPERATURE IN DEGREES FAHRENHEIT												MEANS			RAINFALL								
	MEANS						ABSOLUTE EXTREMES						HUMIDITY			Total	Deviation from Normal	Most in a day		No. of rainfall days				
	9 a.m.	3 p.m.	9 p.m.	A	B	Mean of A and B	Deviation from Normal	Highest	Lowest	Date	Highest	Lowest	Date	Highest	Min.			Date	9 a.m.		3 p.m.	9 p.m.	Amt.	Date
	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	%	%	in.	in.	in.	
JANUARY	78.9	87.1	75.7	88.7	69.1	78.9	-0.8	92	63	16	80	7	74	20, 21	21	21	76	55	84	4.02	1.76	21	7	
FEBRUARY	79.7	89.5	77.6	92.1	68.7	80.4	-0.6	94	66	SEV.	89	16, 20	73	20	20	20	72	50	79	1.61	0.75	28	5	
MARCH	81.9	89.5	78.7	91.6	72.4	82.0	-0.5	96	68	12, 13	87	18	75	SEV.	SEV.	SEV.	75	56	86	5.39	1.39	1	11	
APRIL	81.9	87.7	78.3	90.4	73.4	81.9	-0.4	95	71	6, 20	78	28	76	16	16	16	79	65	91	10.21	1.62	26	17	
MAY	81.6	85.9	79.9	87.9	75.3	81.6	-0.6	92	73	3, 9	83	8, 11	78	18	18	18	83	72	89	10.59	2.03	7	22	
JUNE	80.5	85.2	78.7	87.3	74.4	80.9	-0.4	92	72	16	81	20, 27	77	1, 14	14	14	83	70	89	6.73	0.93	26	21	
JULY	79.9	86.1	79.7	87.7	74.7	81.2	+0.2	90	71	14, 15	84	12, 14	77	SEV.	SEV.	SEV.	85	69	89	6.73	1.35	26	17	
AUGUST	79.4	84.4	77.9	86.9	73.5	80.2	-0.6	90	71	10, 15	83	23, 25	77	2, 6	6	6	84	71	89	15.45	3.25	23	22	
SEPTEMBER	81.0	85.5	78.4	87.5	74.4	80.9	+0.4	89	73	SEV.	82	2	79	16	16	16	81	68	91	3.29	0.75	6	16	
OCTOBER	80.6	83.9	77.1	86.9	73.9	80.4	+0.1	90	71	3, 27	80	30	76	24	24	24	83	75	93	10.36	1.92	9	26	
NOVEMBER	80.2	82.2	76.6	86.9	73.7	80.3	+0.4	91	72	SEV.	83	7	76	18, 19	19	19	83	79	94	7.80	1.23	14	22	
DECEMBER	79.7	83.7	75.9	87.8	72.3	80.1	+0.6	91	69	28	79	4	75	7	7	7	81	71	92	5.19	2.08	21	17	
Total	87.37	203
Means or Extremes	80.4	85.1	77.9	88.5	73.0	80.7	-0.2	96	63	...	78	...	79	...	...	...	80.4	66.7	88.8	...	3.25	...	...

CHART I





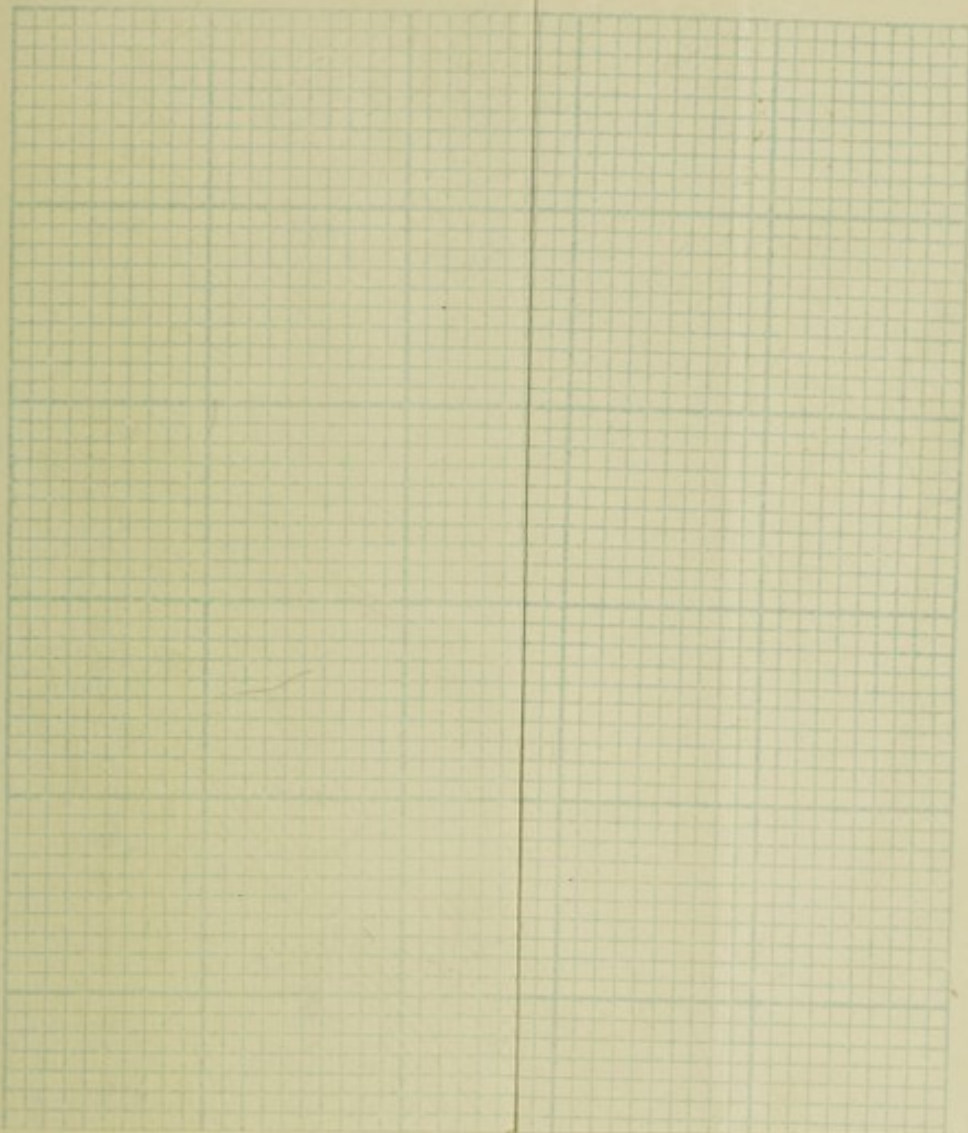
2600

2400

2200

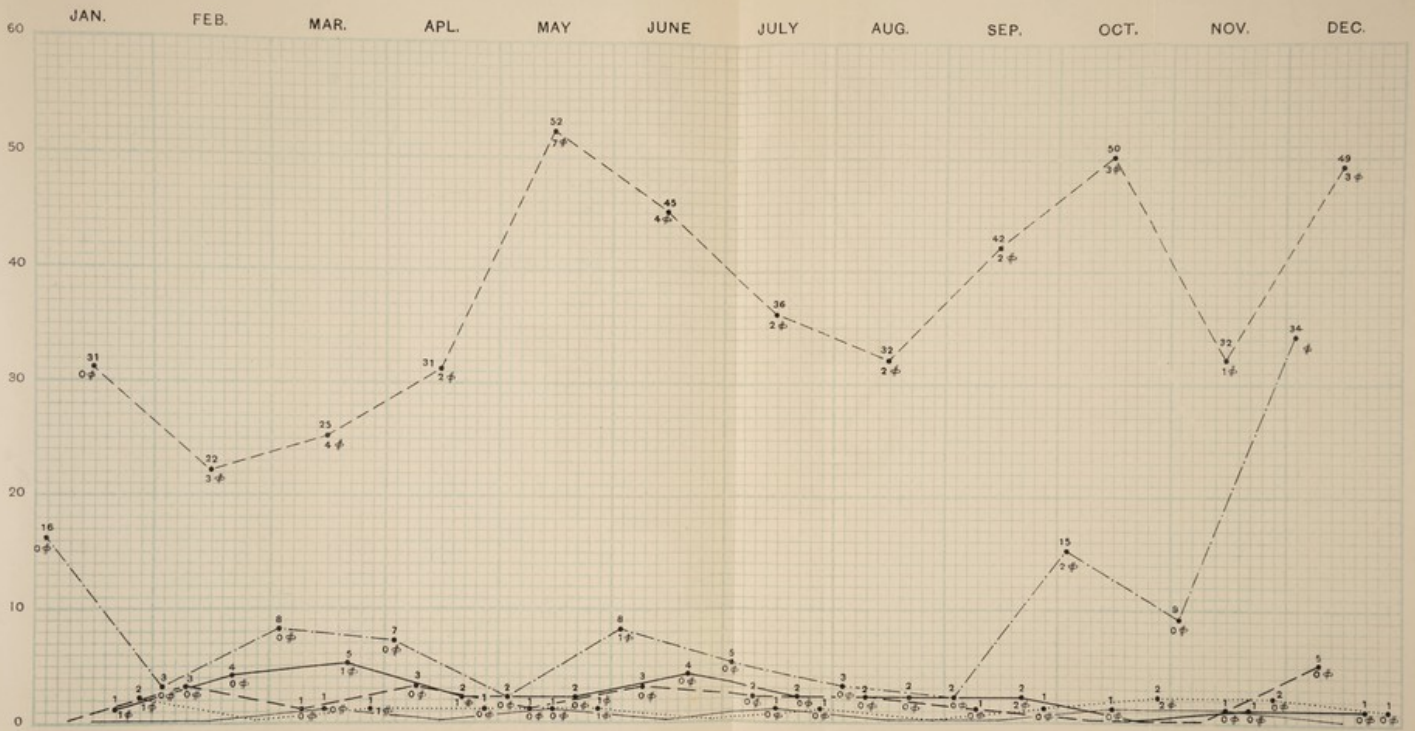
2000

1800



[Faint, illegible text covering the majority of the page, likely bleed-through from the reverse side.]

CHART 1



C

CHART SHOWING PREVAILING DISEASES AMONG ESTATE POPULATION
 ADMISSIONS TO GOVT. HOSPITALS WITH DEATHS FOR THE PERIOD
 JANUARY 1935 TO DECEMBER 1935

REFERENCE			
Other Diseases	---	Dysentery	—
Malaria	—	Other Bowel Diseases	—
Ankylostomiasis	—	Deaths	+
Pneumonia		

1942

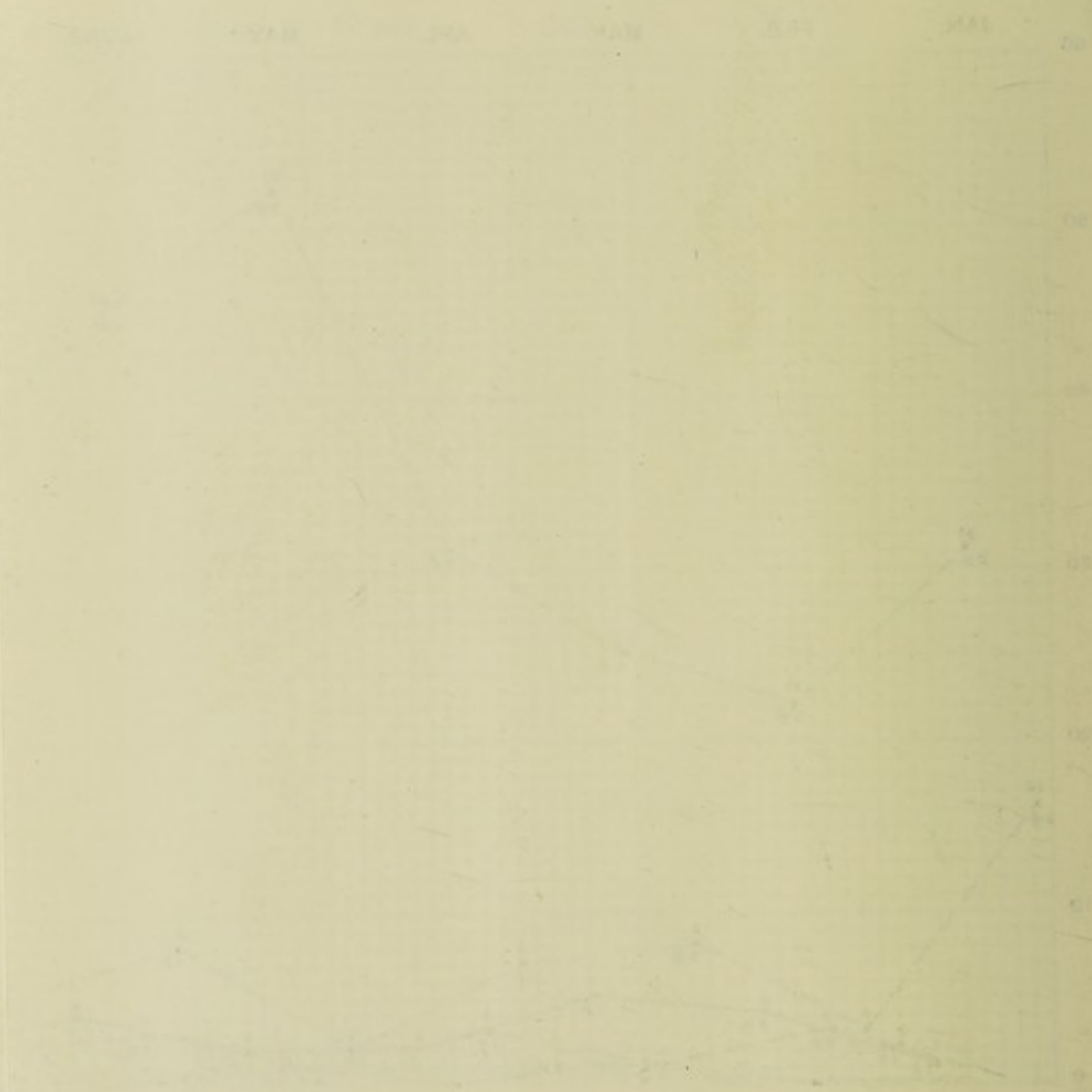
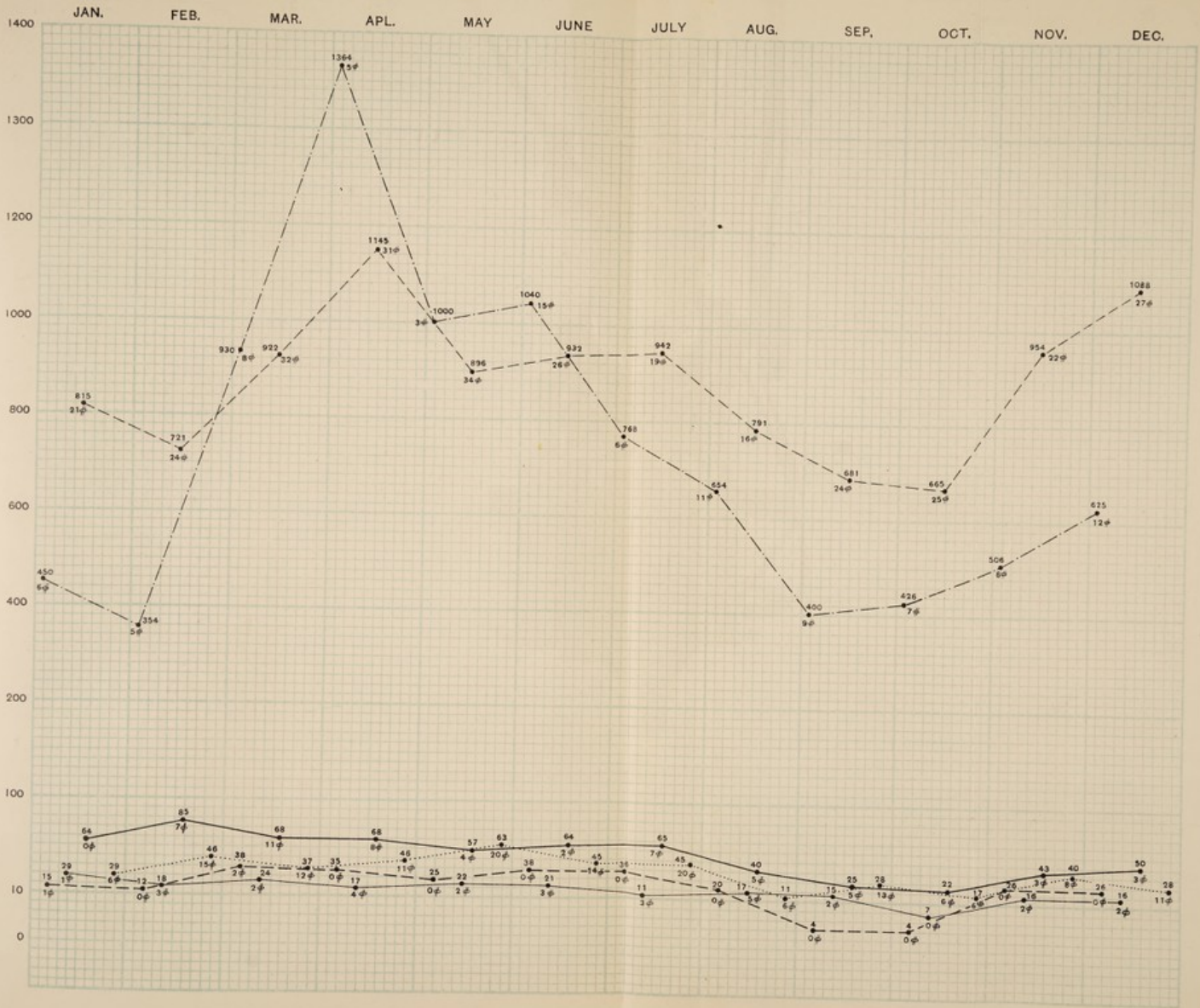


CHART SHOWING THE NUMBER OF
ADMISSIONS TO GOVT HOSPITALS
DURING 1942

Date: _____
 Name: _____
 Title: _____
 Office: _____

CHART 1



D

CHART SHOWING PREVAILING DISEASES AMONG ESTATE POPULATION
ADMISSIONS TO GROUP HOSPITALS WITH DEATHS FOR THE PERIOD
JANUARY 1935 TO DECEMBER 1935

REFERENCE

Other Diseases	---	Dysentery	—
Malaria	—	Other Bowel Diseases	—
Ankylostomiasis	---	Deaths	⊕
Pneumonia	.....	

JAN FEB MAR APR MAY JUN JUL AUG SEPT OCT NOV DEC

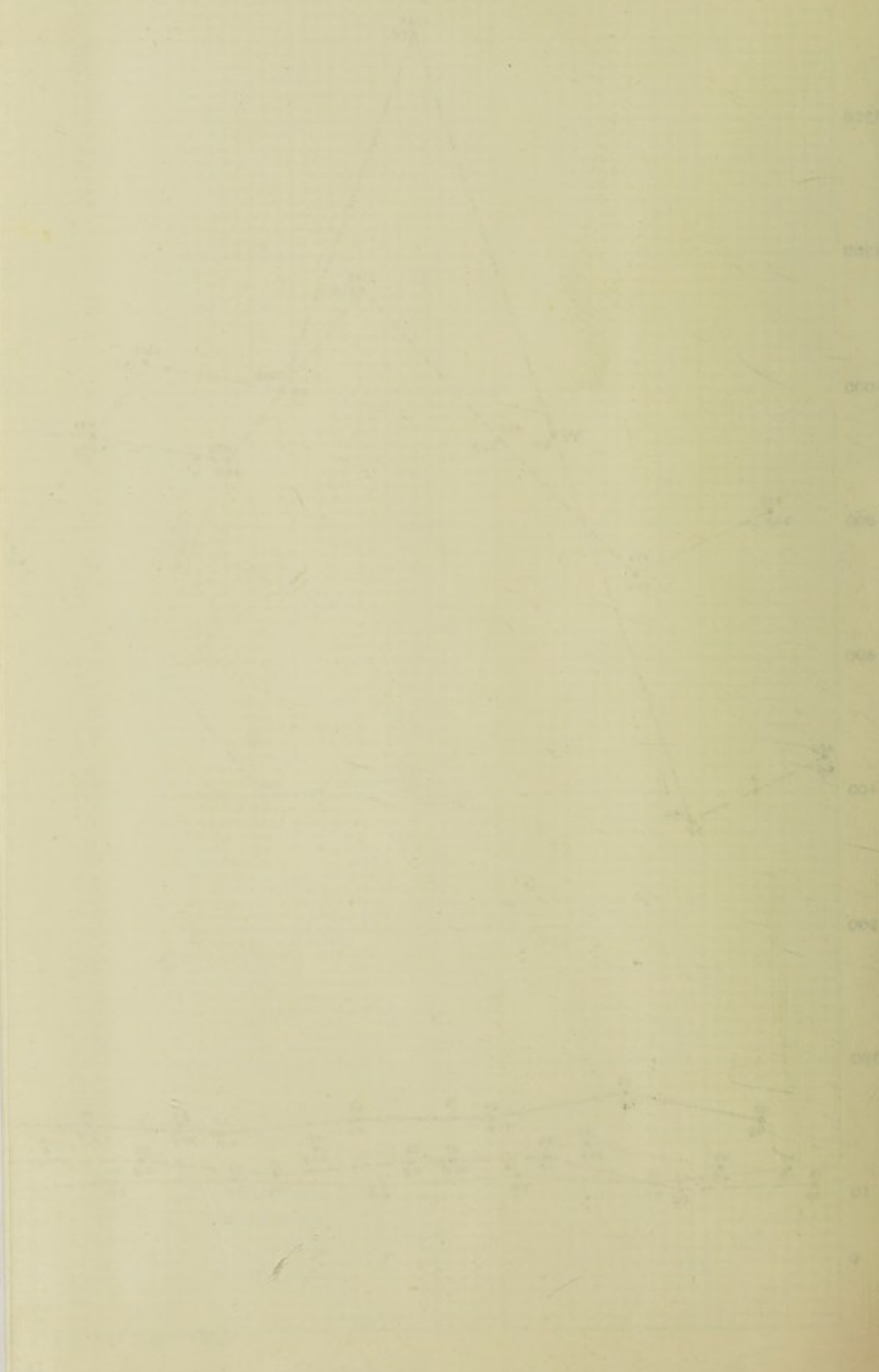
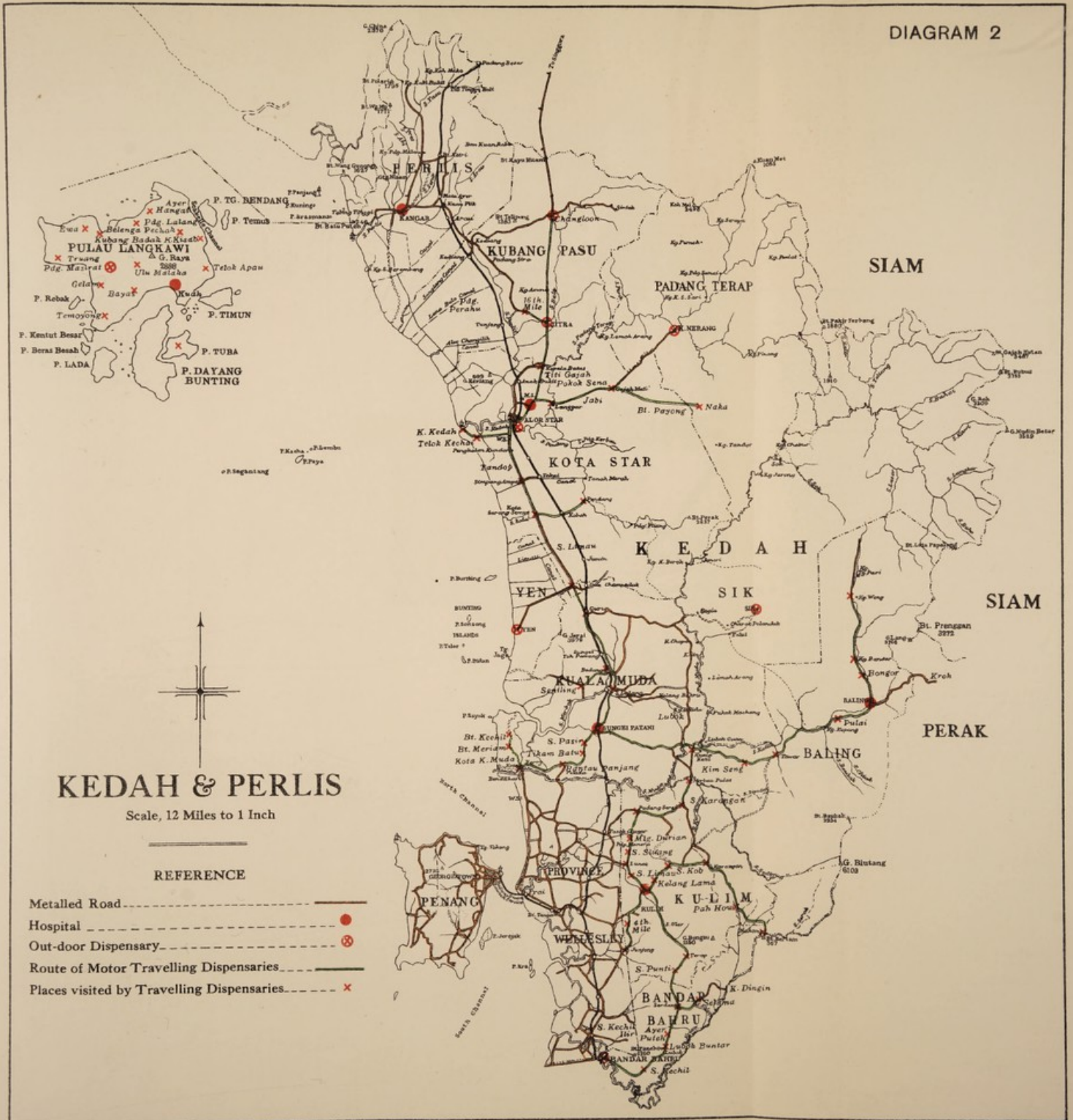


CHART I



E
RECORD OF RAINFALL
FROM 1932 TO 1935

DIAGRAM 2



KEDAH & PERLIS

Scale, 12 Miles to 1 Inch

REFERENCE

- Metalled Road ————
- Hospital ———— (●)
- Out-door Dispensary ———— (⊗)
- Route of Motor Travelling Dispensaries ————
- Places visited by Travelling Dispensaries ———— (x)

LEONARD & PERLIS

MEDICAL AND SANITARY REPORT, PERLIS.

FOR THE YEAR 1935 A. D.

(25th Ramthan, 1353 A. H. to 5th Shawal, 1354 A. H.)

I. ADMINISTRATION.

(a) STAFF.

The principal appointments are:—

The State Surgeon, Kedah, who visits once a month and oftener if required.

1 Assistant Surgeon.

1 Hospital Assistant, Grade I.

1 Dresser Grade II.

1 Dresser Grade III.

1 Vaccinator.

1 Midwife.

(b) FINANCIAL.

Revenue collected	..	..	..	..	..	\$ 1,521.27
Expenditure	..	..	..	..	..	\$24,124.10

(c) BUILDINGS.

The following buildings were completed and occupied during the year:—

Second Class Ward with 6 beds.

Quarters for Second Grade Dresser.

Two cells for accommodation of mental cases.

Ward for Infectious Diseases.

In addition, alterations were done to the latrine of the Female Ward and most of the buildings in the Hospital were painted.

The drains in the hospital compound are old and cracked and have no proper out-fall; new drains replacing the old ones are in the course of construction.

(d) GENERAL.

The Adviser, Medical and Health Services, Malay States, paid an official visit to the State during the third week of October, 1935.

II. PUBLIC HEALTH.

Two cases of diphtheria (with no deaths) were encountered in Kangar.

30 cases of Chicken-pox, two cases of measles and one case of mumps were seen during the year.

9 cases of enteric fever (with one death) were admitted into hospital; in the register of deaths, 14 deaths outside the hospital have been ascribed to enteric fever.

No case of tropical typhus was reported.

20 cases of dysentery with one death were treated at the hospital against 18 with one death in 1934. Most (17) of them were amoebic.

56 cases of ankylostomiasis with 3 deaths were reported as against 85 with 4 deaths in 1934.

32 cases of tuberculosis were admitted into hospital with 8 deaths against 27 with 7 deaths in 1934. 26 deaths from tuberculosis in the State were recorded against 32 in 1934.

As usual, fevers account for the largest portion of the total deaths—370 against 377 in 1934. There was a slight increase in the number of cases admitted into hospital for malaria—356 against 347 in 1934, while the mortality was distinctly lower—4 against 18 in 1934.

Infantile convulsions are also a frequent cause of death—88 against 116 in 1934.

Respiratory diseases come next in order to fevers and are responsible for 152 deaths in the State (165 in 1934).

The total death rate was 16.63—slightly lower than that in 1934. Total deaths recorded amount to 850 against 885 in 1934.

The infantile mortality records show 122 deaths as against 139 in the last year—79.07 against 83.43 in 1934.

Births during the year show a slight decrease (1,640 against 1,730 in 1934)—the birth rate 32.09 per mille being almost the same as last year—32.81. 13 deaths were recorded as due to affections connected with pregnancy and parturition or a percentage of 0.794 to total births. The figure for 1934 was 17 deaths or a percentage of 0.98.

Two cases of cut-throat and three of hanging 5 cases of suicide (three Malays and two Chinese), rather a high figure for the State, were recorded during the year.

Larval surveys by the larvae collector and identifier show the prevalent types as in Appendix E.

The health of the prisoners in Kangar Gaol was satisfactory; of the 22 prisoners who remained in the gaol at the beginning of the year and 103 who were admitted during the year, 33 cases were admitted into hospital (for further details, vide Appendix C).

The health of the Government Servants was not satisfactory; a fair number of them were afflicted with malaria towards the last quarter of the year; all were examined for signs of pulmonary tuberculosis and two were found to be suffering from active disease.

HYGIENE AND SANITATION.

The principal villages of the State viz., Kangar, Arau, Kaki Bukit, and Padang Besar are under control of a Sanitary Board.

The year 1935 is memorable in the history of Perlis in that it has witnessed the initiation of a number of services designed to improve the sanitation and hygiene of the State.

First and foremost was the appointment of a Sanitary Inspector.

Public latrines have been installed in all the Sanitary Board areas: septic tanks were installed in the Residency and the quarters of the Assistant Engineer; the old primitive earth drains with no outfall in the Sanitary Board areas of Arau and Kangar are being replaced by suitable concrete ones. The lighting of the Sanitary Board areas of Kangar and Arau has been vastly improved by the substitution of petromax lamps for kerosene lights.

The insanitary latrines of most of the schools have been replaced by concrete ones of a sanitary type. The question of the provision of a suitable water supply to the schools has been energetically tackled and now most of the schools are provided with a pure water supply.

Malaria is still the greatest public health problem the State has to solve. Towards the last quarter of the year (owing to the undue prolongation of the rainy weather) a severe out-break of malaria occurred in the State, mainly in Kaki Bukit and Kangar. A fair number of the Government servants at Kangar were infected.

Kaki Bukit, the mining village, is a zone of endemic malaria in Perlis and provides most of the in-patients to the State Hospital, at Kangar. Almost all the inhabitants of the village are heavily infected and it is intended to open an Outdoor Dispensary in the village in the coming year, so that effective treatment can be given to the villagers.

A programme for conducting an active anti-mosquito campaign in the coming year has been drawn up.

The larvae collector was sent to the Institute for Medical Research, Kuala Lumpur, for training in catching and handling mosquitoes. Arrangements have been made for the despatch, from time to time, of adult mosquitoes to the Institute for Medical Research, Kuala Lumpur, for necessary identification and dissection.

A preliminary mosquito-survey of the whole of the Sanitary Board areas in Perlis has been decided upon and towards the end of the year, a survey of the Kangar area was in progress.

It is also proposed to inaugurate a child Welfare Centre on modest lines in the State early in 1936.

WATER SUPPLY.

Every year there has been acute shortage of water supply for about four months (February to May) during period of drought when the tap water supply had to be restricted. With a view to remedy this defect, an auxiliary water filtration plant was installed at Ropoh, two miles from Kangar.

The source of the supply is the adjoining heavily polluted Sungei Jerneh. The plant consists of the usual pumping machinery which delivers the crude river water into high level sedimentation tanks whence the water, after chemical admixture with milk of lime and alum, is filtered under pressure through sand filters. Before entry into the main pipes, the filtered water is dosed with gaseous chlorine.

The whole undertaking was installed at a cost of \$20,000 and the plant is designed to deliver 100,000 gallons of water per diem. The analysis of the water confirms the purity anticipated by its designers.

It will thus be obvious that the policy of improving the health of the State has been steadily and vigorously pursued.

RABIES.

Ten cases of dog bite were reported, the first on 22-1-35 and the last on 6-10-35. Ten dogs were concerned in all; four were unknown stray dogs; five were declared not rabid after being kept under observation for ten days; one was killed on the spot.

The brains of two dogs were sent to the Institute for Medical Research, Kuala Lumpur, through the State Veterinary Surgeon, Kedah, and were both reported to be positive for rabies. Of the five persons bitten by dogs actually rabid or suspected to be rabid, one refused treatment and the other four were sent to Alor Star Hospital for treatment.

Stringent measures were adopted to combat rabies.

OFFICIALS.

The following table gives the Health Statistics of Government Officials (including subordinates) in Perlis.

	Europeans.	Asiatics.
Total number of officials resident	3	316
Average number resident	2	316
Total number on sick list	1	75
Total number of days on sick list	2	1,117
Average daily number on sick list	0.005	3.06
Percentage of sick to average number resident	50.00	23.73
Average number of days on sick leave for each patient	2.00	14.89
Average sick time to each resident	1.00	3.53
Total number invalided .. .. .	..	3
Percentage of invalidings to total resident .. .. .	..	0.95
Total deaths .. .. .	..	2
Percentage of deaths to average resident .. .. .	..	0.63
Number of cases of sickness contracted away from residence .. .. .	..	..

SCHOOLS.

Regular fortnightly visits were made to 16 schools by the Travelling Dispensary. Of the Malay Vernacular Schools (4 girls' and 20 boys' schools) 12 boys' schools were visited by the Assistant Surgeon with the following results:—

1. Total number of children on register	1,164
2. Total number of children inspected	962

	Diseases	No. of Cases	Percentage
1	Splenic enlargement	277	28.79
2	Cardiovascular disease	2	0.21
3	Not vaccinated { never vaccinated	41	4.26
	{ vaccinated; but not taken	23	2.39
4	Ear disease	9	0.94
5	Scabies	20	2.08
6	Yaws	26	2.70
7	Other skin diseases	61	6.34
8	Eye disease	5	0.52
9	Caries Dental	517	53.74
10	Bronchitis	36	3.74

85 school children had N.A.B. injections for yaws.

VACCINATIONS.

1,841 vaccinations were done.

Malays	1,455
Chinese	310
Indians	41
Siamese	35
Total	1,841

ESTATES.

The number of Estates of any importance in Perlis is only four-three owned by Asiatics and one by European.

Nationality	LABOURERS		DEPENDENTS		Infants	Total
	Males	Females	Adults	Children		
Malays	31	19	1	6	2	59
Indians	169	94	5	88	12	368
Chinese	1	...	...	...	...	1
Others ... ..	...	...	...	...	...	...
Total	201	113	6	94	14	428

There were 7 deaths among the Estate population (one child dependent and 6 labourers—all Indians). There were 6 births among the Indian Estate population (including three still births). Admission to hospital numbered 110 with 5 deaths.

VITAL STATISTICS.

(a) The population of Perlis for the middle of 1935 determined by the balancing equation method was 51,101. (The geometrical progression method which had been used in the past to estimate population, has been given up, since it has been recommended that the balancing equation method gives a more accurate figure).

The following is a comparative table for the last six years:—

Year	Estimated Population	Births	Birth rate per mille	Deaths	Death rate per mille
1930 A.D. ...	47,633	1,251	26.26	764	16.04
1931	49,296	1,219	24.74	951	19.29
1932	49,800	1,272	25.54	743	14.92 census figure.
1933	51,644	1,436	27.81	855	16.56
1934	52,723	1,730	32.81	885	16.79
1935	51,101	1,640	32.09	850	16.63

(b) Population according to race with deaths and death rate.

Races	Approximate Population	Deaths	Death rate per mille
Eurasians	10	...	...
Europeans	3	...	...
Chinese	6,137	199	32.43
Malays	42,023	605	14.40
Indians	961	15	15.61
Others (mostly Siamese)	1,967	31	15.76
Total	51,101	850	16.63

There were 122 deaths among infants under one year old, the rate being 79.07 per mille.

(c) Infant death rate for the last six years was:—
(corrected rate)

Year.	Deaths.	Rate per mille.
1930 A.D.	145	119.93
1931 „	179	151.18
1932 „	130	105.01
1933 „	134	96.40
1934 „	139	83.43
1935 „	122	79.07

The infantile death rate per thousand births (excluding still births) among the principal nationalities was:—

Malays	65.23
Chinese	165.94
Indians	58.82
Siamese	25.00

(d) Births according to nationalities and sex.

Nationality	Males	Females	Total
Eurasians .. .. .	...	...	...
Europeans .. .. .	...	...	...
Chinese	134	109	243
Malays	671	662	1,333
Indians	16	7	23
Siamese	20	21	41
Total	841	799	1,640

Three twins were recorded.

(e) Still births according to sex and nationality.

Nationality	Males	Females	Total
Eurasians .. .. .	...	...	...
Europeans .. .. .	...	...	...
Chinese	9	5	14
Malays	43	33	76
Indians	4	2	6
Siamese	1	...	1
Total	57	40	97

(f) Distribution of deaths according to Nationalities and Diseases.

Diseases	Malays		Chinese		Indians		Siamese		Total		Total	Rate per mille of population
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
Malaria	5	6	7	1	...	...	...	...	12	7	19	0.37
Enteric fever	9	4	2	...	...	...	...	...	11	4	15	0.29
Dysentery	...	...	2	...	...	...	...	...	2	...	2	0.04
Influenza	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis, Pulmonary	10	5	8	...	...	...	1	1	19	6	25	0.49
Other forms of tuberculosis	...	...	1	...	...	...	...	...	1	...	1	0.02
Leprosy	...	...	...	...	...	...	...	...	...	...	...	...
Syphilis	...	...	...	...	...	...	...	...	...	...	...	...
Ankylostomiasis	...	...	2	...	1	...	...	...	3	...	3	0.06
Ascariasis	...	2	...	...	...	...	...	...	2	2	2	0.04
Fever unspecified	134	127	36	16	5	2	6	10	181	155	336	6.58
Cancer	1	...	1	...	...	...	...	...	2	...	2	0.04
Beri Beri	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of the heart	...	...	1	...	...	...	...	...	1	...	1	0.02
Heart failure	...	...	1	...	1	...	...	...	2	...	2	0.04
Other diseases of Circulatory sys:...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchitis	11	9	4	...	...	...	1	...	16	9	25	0.49
Pneumonia (all forms)	...	...	37	2	1	...	...	...	38	2	40	0.78
Demam Batok	16	6	5	2	...	...	1	1	22	9	31	0.61
Other diseases of Resp. System	12	7	10	...	1	...	1	...	24	7	31	0.61
Diarrhoea and Enteritis	1	...	1	...	...	...	...	...	2	...	2	0.04
Other diseases of digestive system	14	8	6	1	...	1	...	...	20	10	30	0.59
Convulsions	30	27	20	9	...	...	1	1	51	37	88	1.72
Diseases of nervous sys: and sense organs	1	...	...	...	...	...	...	...	1	...	1	0.02
Nonvenereal diseases of Genito-urinary sys:	...	...	...	...	...	...	...	...	...	...	...	...
Basal	12	6	3	1	...	...	1	...	16	7	23	0.45
Diseases of pregnancy, child birth, etc.	...	11	...	1	...	1	...	...	...	13	13	0.25
Premature birth and diseases of early infancy	...	...	1	1	...	...	...	...	1	1	2	0.04
Old age or Senility	31	57	2	3	...	...	3	3	36	63	99	1.94
Violence (all forms including accidents)	7	2	8	1	...	1	...	...	15	4	19	0.37
Other causes	20	14	3	...	...	1	...	...	23	15	38	0.74
TOTAL	314	291	161	38	9	6	15	16	499	351	850	16.63

(g) Deaths according to Sex and Nationalities.

Nationality			Males	Females	Total
Malays	...	...	314	291	605
Chinese	...	...	161	38	199
Indians	...	...	9	6	15
Siamese	...	...	15	16	31
Total	...	...	499	351	850

(h) Deaths grouped according to Age, Sex and Nationality, 1935.

Age Groups			Sex	Europeans	Eurasians	Malays	Chinese	Indians	Siamese	Total
0	...	...	{ Males	...	...	11	11	1	1	23
			{ Females	...	...	16	5	...	...	21
4 weeks	...	...	{ Males	...	...	8	4	...	...	12
			{ Females	...	...	5	4	...	...	9
3 months	...	...	{ Males	...	...	6	6	...	...	12
			{ Females	...	...	13	3	...	1	17
6 "	...	...	{ Males	...	...	11	5	...	...	16
			{ Females	...	...	12	...	...	...	12
1 year	...	...	{ Males	...	...	38	4	2	2	46
			{ Females	...	...	24	5	...	3	32
5 years	...	...	{ Males	...	...	9	4	...	1	14
			{ Females	...	...	10	3	1	...	14
10 "	...	...	{ Males	...	...	8	2	...	...	10
			{ Females	...	...	5	1	...	...	6
15 "	...	...	{ Males	...	...	7	2	...	...	9
			{ Females	...	...	7	1	...	...	8
20 "	...	...	{ Males	...	...	4	2	...	1	7
			{ Females	...	...	6	1	2	...	9
25 "	...	...	{ Males	...	...	13	5	1	1	20
			{ Females	...	...	16	...	1	1	18
30 "	...	...	{ Males	...	...	16	12	...	1	29
			{ Females	...	...	17	2	1	...	20
35 "	...	...	{ Males	...	...	13	11	1	...	25
			{ Females	...	...	14	2	...	...	16
40 "	...	...	{ Males	...	...	24	17	1	1	43
			{ Females	...	...	16	2	...	1	19
45 "	...	...	{ Males	...	...	17	23	...	...	40
			{ Females	...	...	8	1	...	...	9
50 "	...	...	{ Males	...	...	19	25	...	...	44
			{ Females	...	...	12	...	1	2	15
55 "	...	...	{ Males	...	...	43	17	3	4	67
			{ Females	...	...	24	1	...	2	27
65 "	...	...	{ Males	...	...	34	6	...	1	41
			{ Females	...	...	39	4	...	3	46
75 years and above	...	...	{ Males	...	...	33	5	...	3	41
			{ Females	...	...	47	3	...	3	53
Total Males & Females ...				...	...	605	199	15	31	850

III. HOSPITALS AND DISPENSARIES.

GENERAL HOSPITAL, KANGAR.

The number of indoor cases treated during the year was 1,495, a slight increase over the number of cases treated during 1934. There were 81 deaths, being a percentage of 5.42 to total treated. Excluding 28 deaths which occurred within 48 hours of admission, the death rate was 3.61.

The daily average number of inpatients was 52.05. The largest number of inpatients on one day was 83 on 17-10-35 and 20-10-35.

Indoor patients according to nationalities.

Nationality			No. treated	Deaths	Percentage of deaths	Deaths within 48 hours
Chinese	...	...	797	88	8.53	24
Indians	...	...	471	8	1.70	3
Malays	...	...	215	4	1.86	1
Javanese	...	...	4	...	...	...
Siamese	...	...	8	1	12.50	...
Total ...			1,495	81	5.42	28

There was an increase in the number of cases admitted for malaria, dysentery amoebic, other lung complaints, injuries and other diseases; the number admitted for pulmonary tuberculosis and ulcers was about the same; and there was a fall in the number of cases admitted for venereal diseases, pneumonia and ankylostomiasis.

ADMISSIONS FROM ESTATES AND MINES.

The total number of patients from Estates and Mines was 118 with 5 deaths or a percentage of 4.25.

Nationality				Remained	Admitted	Total	Deaths
Chinese	...	...	...	...	4	4	...
Indians	...	...	...	4	110	114	5
			Total	4	114	118	5

PREVAILING DISEASES.

Diseases	1931 A. D.			1932 A. D.			1933 A. D.			1934 A. D.			1935 A. D.			Deaths within 24 hours of admission
	Cases	Deaths	Percentage	Cases	Deaths	Percentage	Cases	Deaths	Percentage	Cases	Deaths	Percentage	Cases	Deaths	Percentage	
Malaria ...	367	16	4.36	297	8	2.69	363	17	4.68	362	18	4.97	376	4	1.06	3
Dysentery amoebic ...	12	1	8.30	7	1	14.29	19	...	...	14	...	...	17	1	5.88	...
Dysentery, others ...	6	1	16.70	5	...	...	6	1	16.67	...	...	...	...	...	...	...
Veneral Diseases ...	45	...	...	43	...	...	62	...	...	46	1	2.08	35	...	...	...
Pulmonary tuberculosis ...	29	6	20.70	46	10	21.74	24	3	12.50	27	6	22.22	29	7	24.14	...
Pneumonia ...	44	30	68.20	35	16	45.71	55	19	34.55	73	43	58.90	68	40	58.82	8
Other lung complaints ...	62	4	6.40	76	3	3.95	119	5	4.20	78	5	6.41	96	8	8.33	...
Ankylostomiasis ...	48	...	...	28	...	...	47	5	10.64	87	4	4.60	61	3	4.92	...
Ulcers ...	57	...	...	51	...	...	58	...	...	53	...	...	56	...	...	...
Injuries ...	64	...	...	103	1	0.97	104	2	1.92	96	...	...	107	2	1.87	2
Other diseases ...	365	24	6.50	414	23	5.56	522	29	5.55	565	37	6.55	650	16	2.46	7
TOTAL ...	1,099	82	7.50	1,105	62	5.61	1,379	81	5.90	1,403	114	8.13	1,495	81	5.42	20

Infectious Diseases with Deaths.

Diseases	Total treated	Deaths	Percentage of deaths
Chicken-pox	1	...	...
Diphtheria	1	...	...
Dysentery, Amoebic	17	1	5.88
Dysentery,—type undiagnosed	3	...	...
Enteric Fever	9	1	11.11
Erysipelas	3	...	...
Influenza	79	...	...
Leprosy	1	...	...
Measles	2	...	...
Mumps	1	...	...
Pneumonia	68	40	58.82
Tetanus	3	2	66.67
Tuberculosis	34	8	23.53
Total	222	52	23.42

SURGICAL OPERATIONS.

7 major operations and 260 minor operations were performed.

LABORATORY WORK.

Blood films were examined in 3,120 instances with the following results:—

Malaria B.T.	320
„ M.T.	279
„ Quartan	7
„ mixed	39
Negative	2,475
Total	3,120

Other specimens examined totalled 2,890. (For details vide Appendix—B).

POST MORTEM EXAMINATIONS.

Medico-legal	17
Pathological	17
Total	34

OUT-DOOR CASES.

Number of new cases	..	..	..	..	..	7,096
Repetitions	..	..	..	..	..	3,013
The nationalities who received treatment were:—							
Chinese	..	..	..	..	..	1,178
Indians	..	..	..	..	..	1,307
Malays	..	..	..	..	..	4,512
Siamese	..	..	..	..	..	35
Europeans	..	..	..	..	..	37
Eurasians	..	..	..	..	..	27
						—	
Total						..	7,096
						—	

In addition to those treated at the hospital dispensary, 110 cases were treated in the Kangar Gaol.

The hospital midwife attended 9 cases of confinement in their houses.

Neosalvarsan injections numbered 1,471, of which 1,316 were for yaws and 155 for other conditions.

Of the 987 new cases of yaws that were treated during the year, only a few came up for subsequent injections (vide table below):—

777 patients took only one injection.

140 patients took only two injections.

43 patients took only three injections.

25 patients took only four injections.

1 patient had seven injections.

1 patient has nine injections.

The travelling dispensary attended to 1,221 cases excluding those attended at schools, police stations and cooly lines.

Four mental cases (two males and two females) were transferred to the Central Mental Hospital, Tanjong Rambutan, during the year; one was discharged as cured during the period under review; there were 17 Perlis patients (9 males and 8 females) in that institution at the end of 1935.

There was one Perlis leper at Pulau Jerejak Leper Settlement at the end of 1935.

APPENDIX—A.

ANNUAL RETURN OF INDOOR PATIENTS, TREATED IN GENERAL HOSPITAL,
 PERLIS, DURING THE YEAR 1935 A. D.

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
INFECTIVE DISEASES.						
Chicken pox	...	1	...	1	...	
Diphtheria	...	1	...	1	...	
Dysentery Amœbic	2	15	1	17	...	
" Type undiagnosed	1	2	...	3	...	
Enteric Fever	...	9	1	9	1	
Erysipelas	...	3	...	3	...	
Gonorrhœa	1	15	...	16	1	
Gonorrhœal Arthritis	...	3	...	3	...	
" Conjunctivitis	...	1	...	1	...	
" Epididymitis	...	1	...	1	...	
" Rheumatism	...	3	...	3	...	
" Synovitis	...	3	...	3	...	
Influenza	...	79	...	79	1	
Leprosy	...	1	...	1	...	
Malaria :—						
(a) Benign Tertian	9	135	...	144	6	
(b) Quartan	...	2	...	2	...	
(c) Malignant Tertian	4	128	1	132	4	
(d) Mixed Infection	3	27	1	30	...	
(e) Type undiagnosed	3	63	2	66	7	
(f) Malarial Cachexia	1	1	...	2	...	
Measles	...	2	...	2	...	
Mumps	1	...	...	1	...	
Pneumonia	1	67	40	68	1	
Pyrexia of uncertain origin	...	48	1	48	1	
Rheumatism	...	11	...	11	...	
Syphilis :—						
(a) Primary	...	6	...	6	1	
(b) Secondary	...	1	...	1	...	
(c) Congenital	...	...	...	...	...
(d) Tertiary	...	1	...	1	...	
Tetanus	...	3	2	3	1	
Tuberculosis :—						
(a) Pulmonary	2	27	7	29	6	
(b) Peritonitis	...	1	...	1	...	
(c) Caries spine	...	2	1	2	...	
(d) Cervical adenitis	...	2	...	2	...	
Yaws	1	3	...	4	...	
INTOXICATIONS.						
Alcoholism	...	1	...	1	...	
GENERAL DISEASES						
Beri-beri	2	1	...	3	...	
Diabetes	...	2	...	2	...	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
CERTAIN MORBID CONDITIONS INCIDENT TO VARIOUS PARTS.						
New growth, Malignant ...	1	2	1	3		
" " non-malignant ...	...	1	...	1	...	
DISEASES OF THE NERVOUS SYSTEM.						
Nerves :—						
Neuritis ...	2	10	...	12	...	
Spinal Cord and Membranes :—						
Myelitis ...	...	1	1	1	...	
Locomotor ataxia ...	1	...	...	1	1	
Brain and Membranes :—						
Encephalitis lethargica ...	...	1	...	1	...	
Nervous Disorders :—						
Apoplexy ...	...	1	...	1	...	
Hemiplegia ...	1	1	...	2	1	
Paraplegia ...	...	1	...	1	...	
Mental Diseases :—						
Mania ...	...	2	...	2	...	
Observations ...	...	18	...	18	3	
DISEASES OF THE EYE.						
Conjunctivitis ...	...	7	...	7	...	
Trachoma ...	...	1	...	1	...	
Keratitis ...	...	1	...	1	...	
Ulcer of Cornea ...	...	3	...	3	...	
Iritis ...	...	2	...	2	...	
Cataract ...	...	1	...	1	...	
Panophthalmitis ...	...	1	...	1	...	
Entropion ...	...	1	...	1	...	
DISEASES OF THE EAR.						
Inflammation ...	...	5	...	5	1	
DISEASES OF THE CIRCULATORY SYSTEM.						
Valvular disease ...	...	1	...	1	...	
Myocarditis ...	...	10	1	10	3	
DISEASES OF THE RESPIRATORY SYSTEM.						
Asthma ...	2	14	...	16	2	
Bronchitis ...	1	35	1	36	1	
Broncho-pneumonia ...	...	27	4	27	1	
Pleurisy ...	...	10	...	10	...	
Empyema ...	1	6	3	7	2	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
DISEASES OF THE DIGESTIVE SYSTEM.						
Caries of tooth	1	...	1	...	
Sore throat	1	...	1	...	
Gastritis	2	...	2	...	
Ulceration of stomach	4	...	4	...	
Duodenal Ulcer	1	2	...	3	...	
Dyspepsia	2	...	2	...	
Appendicitis	4	...	4	...	
Colitis	3	...	3	...	
Hernia	1	...	1	...	
Intestinal obstruction	1	...	1	...	
Diarrhoea	2	1	2	...	
Colic	1	12	...	13	1	
Hemorrhoids	2	...	2	...	
Hepatitis	6	...	6	...	
Abscess of liver	2	...	2	1	
Cirrhosis of liver	1	7	...	8	...	
Jaundice	7	...	7	...	
Stricture of rectum	2	...	2	...	
DISEASES OF THE LYMPHATIC SYSTEM.						
Bubo	4	...	4	...	
Lymphangitis	1	3	...	4	1	
Other diseases of the system	3	...	3	...	
DISEASES OF THE URINARY SYSTEM.						
Bright's disease	4	...	4	...	
Pyelitis	1	...	1	...	
Cystitis	4	...	4	...	
Calculus	2	...	2	...	
Other diseases of the system	1	...	1	...	
DISEASES OF THE GENERATIVE SYSTEM.						
<i>Male :—</i>						
Stricture	1	...	1	...	
Urethral fistula	1	...	1	...	
Paraphimosis	1	...	1	...	
Soft chancre	2	...	2	...	
Hydrocele	1	...	1	...	
Phimosis	1	...	1	...	
Epididymitis	1	...	1	...	
Enlarged prostate	1	...	1	...	
Ulcerating granuloma	1	1	...	2	...	
<i>Female :—</i>						
Endometritis	1	...	1	...	
AFFECTIONS CONNECTED WITH PREGNANCY AND PARTURITION.						
Natural Labour	18	...	18	...	
Difficult Labour	1	...	1	...	
Premature Labour	1	...	1	...	
Abortion	2	...	2	1	
Retention of placenta	1	1	1	...	
Premature birth	1	1	1	...	
Prolapse of uterus	1	1	1	...	
Pregnancy-waiting case	4	...	4	...	

Diseases	Remained	Admitted	Died	Total	Remaining	Remarks
AFFECTIONS CONNECTED WITH PREGNANCY AND PARTURITION.—(Contd.)						
Puerperal sapraemia ...	...	1	...	1	...	
Eclampsis ...	...	1	...	1	...	
Albuminuria complicating pregnancy ...	...	1	...	1	...	
DISEASES OF THE ORGANS OF LOCOMOTION.						
Caries of bones ...	1	...	...	1	...	
Arthritis ...	...	1	...	1	...	
Synovitis ...	...	3	...	3	...	
Ankylosis ...	...	1	...	1	...	
DISEASES OF THE CONNECTIVE TISSUE.						
Cellulitis ...	1	2	1	3	1	
Abscess ...	1	39	...	40	2	
Gangrene ...	...	1	1	1	...	
DISEASES OF THE SKIN.						
Urticaria ...	...	1	...	1	...	
Eczema ...	...	4	...	4	...	
Boil ...	...	9	...	9	...	
Carbuncle ...	...	1	...	1	...	
Ulcer ...	3	53	...	56	3	
Other skin diseases ...	...	1	...	1	...	
INJURIES.						
Burns and scalds ...	...	4	...	4	...	
Dog-bite ...	...	2	...	2	...	
Snake-bite ...	...	5	1	5	...	
Wounds ...	5	77	1	82	5	
Sprains, contusions etc. ...	1	9	...	10	...	
Fracture, simple ...	...	2	...	2	...	
.. compound ...	...	2	...	2	...	
PARASITES.						
Ascaris lumbricoides ...	...	41	...	41	1	
Ankylostomiasis ...	5	56	3	61	...	
Ringworm ...	...	1	...	1	...	
Scabies ...	...	11	...	11	...	
ILL-DEFINED CAUSES.						
Marasmus ...	...	1	...	1	...	
Heart failure ...	...	2	2	2	...	
UNDER OBSERVATION ...	1	61	...	62	...	
FOR THE SAKE OF MOTHER, CHILD, ETC. ...	4	78	...	82	1	
TOTAL ...	67	1,428	81	1,495	62	

Percentage of deaths to total treated	5.42
Total number of cases which proved fatal within 48 hours of admission	28
Percentage of deaths to total treated excluding deaths occurring within 48 hours of admission	3.61
Average duration of stay in hospital of fatal cases	8.36 days
Average daily number of sick	52.05
Largest number of sick on one day with date 83 on 17-10-1935 and 20-10-1935.	
Total number of beds	60
Deaths occurred within 24 hours of admission	20

OPERATIONS.

Major operations	7
Minor operations	260

APPENDIX—B.

Laboratory Work.

Specimens	Positive	Negative	Total
Blood (Malaria)	645	2,475	3,120
Pus	28	18	46
Eye Smear	3	11	14
Nasal Smear ... ..	...	7	7
Sputum (Tubercle bacilli)	22	179	201
Stool	1,069	500	1,569
Urine	161	892	1,053
Total	1,928	4,082	6,010

APPENDIX—C.

Return of sick prisoners admitted into Kangar Hospital, 1935.

Diseases				Cases	Deaths
Abscess alveolar	...	...	...	1	...
Asthma bronchial	...	...	...	1	...
Bronchitis	...	...	...	1	...
Colic	...	...	...	1	...
Colitis	...	...	...	1	...
Corneal ulcer	...	...	...	2	...
Cystitis	...	...	...	1	...
Hepatitis	...	...	...	1	...
Influenza	...	...	...	9	...
Malaria, benign tertian	...	...	...	3	...
Malaria, type not diagnosed	...	...	...	2	...
Pyrexia of uncertain origin	...	...	...	2	...
Snake bite	...	...	...	1	...
Sore throat	...	...	...	1	...
Sprain	...	...	...	1	...
Ulcer	...	...	...	1	...
Wound	...	...	...	2	...
For observation	...	...	...	2	...
Total				33	...

APPENDIX—D.

Report showing the number and types of Larvae collected in Perlis, 1935.

FOUND AT			Aconitus	Barbistrotris	Fuliginosus	Hyrcanus	Kochii	Sinensis	Vagus	REMARKS.
Arau	...	...	...	26	25	4	74	9	57	
Kangar	...	...	10	181	97	120	192	23	142	
	TOTAL	...	10	207	122	124	266	32	199	

TABLE XXI.

CLIMATOLOGICAL SUMMARY.

Station—KANGAR, PERLIS.
 Height above M.S.L. 10 Feet.

Lat. 6° 26' N.
 Long. 100° 12' E.

Year 1935	AIR TEMPERATURE IN DEGREES FAHRENHEIT										MEANS			RAINFALL													
	MEANS				ABSOLUTE EXTREMES						HUMIDITY			Total		Deviation from Normal		Most in a day		No. of rainfall days							
	9 a.m.	3 p.m.	9 p.m.	A	Max.	B	Mean of A and B	Deviation from Normal	Highest	Date	Lowest	Date	Lowest	Date	Highest	Date	9 a.m.	3 p.m.	9 p.m.		in.	mm.	in.	in.	Amt.	Date	
	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	°F	%	%	%	%	%	%	%	%	%	%	%
JANUARY	80.1	87.1	76.2	88.8	72.0	80.4	...	92	28	65	16	81	7	77	1	76	57	86	86	1.32	...	-0.36	in.	0.38	5	6	
FEBRUARY	81.1	90.3	77.4	92.4	71.6	82.0	...	95	19	67	1	84	20	74	27	70	49	82	82	1.59	...	-0.32	in.	0.85	27	3	
MARCH	83.2	89.7	79.2	92.2	73.8	83.0	...	98	30	72	11, 31	86	18	76	25	76	58	84	84	4.49	...	-0.67	in.	2.30	17	8	
APRIL	83.4	88.8	79.3	91.9	74.1	83.0	...	95	SEV.	72	17, 20	83	28, 29	77	8	79	63	85	85	8.19	...	+0.78	in.	2.63	26	12	
MAY	83.1	86.3	79.6	88.3	75.5	81.9	...	93	6	73	15, 29	85	8	78	7, 18	83	72	91	91	7.19	...	-1.12	in.	2.10	14	18	
JUNE	82.2	85.6	78.3	87.6	73.9	80.7	...	93	1, 2	72	6, 25	81	20, 27	75	SEV.	82	71	91	91	5.58	...	-1.19	in.	0.93	27	16	
JULY	81.7	85.5	79.2	87.3	75.1	81.2	...	91	23	71	14	83	14, 25	78	SEV.	85	74	91	91	5.87	...	-2.31	in.	2.09	13	13	
AUGUST	81.2	85.4	77.6	87.2	73.5	80.3	...	91	7, 10	72	SEV.	82	23	78	5	83	72	92	92	8.03	...	-0.59	in.	1.86	25	22	
SEPTEMBER	82.4	85.5	78.6	88.0	74.5	81.3	...	91	20, 21	72	25, 30	85	27, 29	77	14, 17	80	72	89	89	3.07	...	-7.39	in.	0.93	24	12	
OCTOBER	81.0	84.0	77.2	87.1	74.0	80.5	...	95	14	72	SEV.	79	30	76	13, 23	85	75	94	94	8.82	...	-1.89	in.	1.52	2	20	
NOVEMBER	80.6	82.0	76.9	86.4	73.8	80.1	...	92	4	72	SEV.	82	7	76	15, 18	87	79	94	94	8.83	...	+0.22	in.	2.20	7	18	
DECEMBER	80.4	84.0	75.9	87.3	72.8	80.1	...	90	SEV.	71	SEV.	81	4	76	6	84	73	93	93	4.35	...	+0.09	in.	0.54	3	18	
Yearly { Total Means or Extremes	67.33	...	-14.75	in.	166
	81.7	86.2	77.9	88.7	73.7	81.2	...	98	...	65	...	79	...	78	...	80.8	67.9	89.3	89.3	...	...	...	...	2.63	...	...

TIMES ARE ZONE TIME LONGITUDE 103° E.

Средние значения температуры воздуха

Время суток	Средние значения температуры воздуха												Среднее значение	
	1	2	3	4	5	6	7	8	9	10	11	12		
Январь
Февраль
Март
Апрель
Май
Июнь
Июль
Август
Сентябрь
Октябрь
Ноябрь
Декабрь



Время суток	Средние значения температуры воздуха												Среднее значение	
	1	2	3	4	5	6	7	8	9	10	11	12		
Январь
Февраль
Март
Апрель
Май
Июнь
Июль
Август
Сентябрь
Октябрь
Ноябрь
Декабрь

Среднее значение температуры воздуха

Среднее значение температуры воздуха

Среднее значение температуры воздуха



