Report on the public health administration of the Punjab.

REPORT

ON THE

Public Health Administration of the Punjab

AND

Proceedings of the Sanitary Board

FOR THE YEAR 1924

BY

LIEUTENANT-COLONEL C. A. GILL, D.P.H., D.T.M. & H., I.M.S.,

Offg. Director of Public Health, Punjab

AND

The Report on Sanitary Works for 1924

BY

RAI BAHADUR AMAR NATH, NANDA, B.A., M.I.E. (INDIA),

Offg. Sanitary Engineer to Government, Punjab.

Lahore :

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Section II.—European Army.

No remarks.

Section III.—Native Army.

No remarks.

Section IV.—Jails.

No remarks.

Section VII—Vaccination.

(Separate report.)

Section VIII.—Sanitary Works, Military.

No remarks.

(The text of the Public Health Report is limited to 20 pages and that of the Sanitary Engineer to 4 pages.)

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ERRATA.

Annual Public Health Report of the Punjab for 1924.

1. *For* "$10\frac{1}{2}$" in line 11 of paragraph 2, page 2 *read* "$10\frac{1}{16}$."
2. In line 27 of paragraph 15, page 7 *for* "21·375" *read* "213·75."
3. In paragraph 28, page 16, in line 2 *for* "Crescate fluviis" *read* "Crescat e fluviis."
4. In line 3 of last paragraph on page 26 *for* "deseratum" *read* "desideratum."
5. Appendix B, page VII, column 17, against Jaranwala *for* "658" *read* "558."
6. Appendix H, column 11, against Ferozepore *for* "·1" *read* "1·1."
7. Annual Form No. II, column 3, against Kangra, *for* "2978" *read* "9978."
8. Annual Form No. II, column 6, against Lahore, *for* "483134" *read* "480134."
9. Annual Form No. II, column 7, against Sheikhupura, *for* "623422" *read* "628422."
10. Annual Form No. IV, column 14, against Shahpur, *for* "93" *read* "934."
11. Annual Form No. IV, column 32, against Gujrat, *for* "0" *read* "80."
12. Annual Form No. IV, column 56, against Gurdaspur, *for* "581" *read* "531."
13. Annual Form No. VI A, column 23, against Montgomery, *for* "0·3" *read* "0·38."
14. Annual Form No. VI A, column 21, against Dera Ghazi Khan, *for* "1706" *read* "17068."
15. Annual Form No. VI-B, Karnal district, against Kaithal town, column 25 *for* "3·37" *read* "30·37."
16. Annual Form No. VI-B, Ludhiana district, against Jagraon town, column 6, *for* "337" *read* "837."
17. Annual Form No. VI-B, Ludhiana district, against Raekot town, column 12, *for* "blank" *read* "4."
18. Annual Form No. VI-B, Gujranwala district, against Hafizabad town, column 23, *for* "1·8" *read* "1·18."
19. Annual Form No. VI-B, Rawalpindi district, against Rawalpindi town, column 6, *for* "2238" *read* "2288."
20. Annual Form No. VII, column 15, against Ambala, *for* "26" *read* "23."
21. Annual Form No. XII, column 13, against Gurdaspur, *for* "3" *read* "5."
22. Statement No. I, column 25, against, Karnal, *for* "6 9" *read* "669."

29 DPH—350—30-9-25—SGPP Lahore.

ERRATA.

Annual Public Health Report of the Punjab for 1924.

1. For "10½" in line 11 of paragraph 3, page 2 read "10½."
2. In line 27 of paragraph 18, page 7 for "21·873" read "218·73."
3. In paragraph 28, page 18, in line 3 for "Crescent Rovin" read "Crescent a Rovin."
4. In line 3 of last paragraph on page 28 for "decretum" read "decretum."
5. Appendix B, page VII, column 17, against Jagraon for "859" read "858."
6. Appendix E, column 11, against Ferozepore for "·1" read "1·1."
7. Annual Form No. II, column 3, against Lahore, for "2078" read "6078."
8. Annual Form No. II, column 5, against Lahore, for "488184" read "480184."
9. Annual Form No. II, column 7, against Shahpur, for "82 [illegible]" read "82442."
10. Annual Form No. IV, column 14, against Shahpur, for "98" read "814."
11. Annual Form No. IV, column 17, against Gujrat, for "0" read "80."
12. Annual Form No. IV, column 50, against Gurdaspur, for "381" read "431."
13. Annual Form No. VI A, column 28, against Montgomery, for "0·3" read "0·38."
14. Annual Form No. VI A, column 21, against Dera Ghazi Khan, for "1206" read "17058."
15. Annual Form No. VI-B, Kasur district, against Kasur town, column 25 for "3·87" read "30·87."
16. Annual Form No. VI-B, Lyallpur district, against Jaranwala town, column 8, for "837" read "837."
17. Annual Form No. VI-B, Lyallpur district, against Rasul town, column 12, for "blank" read "4."
18. Annual Form No. VI-B, Gujranwala district, against Hafizabad town, column 28, for "1·3" read "1·18."
19. Annual Form No. VI-B, Rawalpindi district, against Rawalpindi town, column 6, for "22238" read "2238."
20. Annual Form No. VII, column 18, against Ambala, for "26" read "25."
21. Annual Form No. XII, column 18, against Gurdaspur, for "3" read "5."
22. Statement No. I, column 25, against, Karnal, for "6 3" read "653."

25 DPH—350—30-9-25—30 P.P. Lahore.

Proceedings of the Punjab Government (Ministry of Education) in the Home (Medical and Sanitary) Department No. 19171, dated 27th August 1925.

READ—

Report on the Public Health Administration of the Punjab for the year 1924.

Remarks.—In 1923 plague, of which there had been an epidemic of moderate severity in the spring months, lingered on through the hot weather in an unusually large number of districts and in the autumn recrudesced to an alarming extent. Circumstances were, therefore, eminently favourable for its extension at the beginning of 1924 and as a result of the prolongation of cold weather conditions to the end of May the epidemic continued to gain force on an ever-increasing scale. In December the mortality had been 2,481; in January it rose to 4,364, in February to 13,753, in March to 50,395 and in April to 86,469: in May it subsided to 63,313 and in June to 22,282. By the end of July the epidemic had spent itself, but it had taken a toll of 246,096 lives and by the end of the year the mortality exceeded a quarter of a million,—a figure surpassed in only three years since the first appearance of plague in the province. This appalling calamity is naturally reflected in the statistics of the year, and the death rate rose from 30·9 *per mille* in the previous year to 43·43 *per mille*, plague accounting for 9·8 out of the 12·53 of increase. It seems, however, that the mortality from plague was really even greater than would appear from the statistics, as the Director of Public Health is inclined to attribute to bubonic, pneumonic and septicæmic plague many of the deaths recorded as due to "fever": for the "fever" mortality during the season of epidemic malaria was considerably lower than in the previous year, though for the year as a whole it was higher, and this increase cannot be accounted for as due solely to the outbreaks of relapsing fever in the districts of Muzaffargarh and Dera Ghazi Khan. Many cases of pneumonic and septicæmic plague were also, in the opinion of the Director of Public Health, probably recorded under the head of respiratory diseases.

2. In view of the probability of a severe epidemic of plague the Public Health Department at the beginning of the year concentrated its efforts on an attempt to limit the spread of infection by intensive rat destruction in infected villages, the disinfection of dwellings and inoculation of persons exposed to infection. The available staff was, however, inadequate, while the necessity for taking preventive measures was not recognised in many places, especially towns, until it was too late: the epidemic was thus able to develop with the intensity described above, and all available resources had to be devoted to fighting plague as it appeared. Sixty private medical practitioners were engaged, and the cordial co-operation of the Medical Department with the Department of Public Health enabled steps to be taken which though not successful in preventing a very high mortality must have saved a large number of lives. The voluntary resort of the people to anti-plague inoculation was particularly satisfactory, and nearly half a million persons were thus protected: evacuation of infected villages was, however, not so popular, and where practised was often too late and incomplete, while in the case of towns evacuation took the form of flight to non-infected places, thus assisting in the spread of the disease. The chief lessons which the Director of Public Health draws from the experience of the year are, therefore, in the first place the great importance of intense rat destruction during the quiescent period in potential centres of plague and the necessity on the first appearance of plague for immediate and complete evacuation of infected buildings, not accompanied by flight to other places. With these conclusions Government are in accord, and therefore sanctioned the retention of the special staff engaged to deal with the outbreak in order that an intensive rat destruction campaign might be carried out during the quiescent period. These measures proved reasonably successful, and in the majority of villages that were treated there was no recrudescence of plague in the autumn.

3. While the plague epidemic was the predominant feature of the year there were other factors which contributed to the bad record

of 1924. The outbreak of relapsing fever in two districts has already been referred to : the mortality was not, however, serious, and the epidemic was important chiefly for the manner in which it demonstrated the value of precautionary measures and the effective education of popular opinion. Cholera also re-appeared in epidemic form and was responsible for over 3,000 deaths as compared with 11 in the previous year, but the prompt action taken by officers of the Public Health Department was successful in preventing the spread of infection.

4. In a year in which the death-rate was so high it is satisfactory to find that the birth-rate was maintained at a high level and was very little lower than the average rate of the preceding five years. This satisfaction must, however, be tempered by consideration of the fact that the rate of infant mortality was very much greater than the average rate of the previous quinquennium, amounting to 212·57 per 1,000 births as compared with 185·28, figures which emphasize the extreme urgency of fostering by every possible means public interest in infant welfare work with regard to which, however, the report is almost entirely silent, presumably because this work is at present largely in the hands of a non-official organisation.

5. The Ministry of Education have read with much interest the observations of the Director of Public Health as to the public health problems of urban and rural areas respectively. He points out that in towns the chief causes of mortality are respiratory diseases and diseases of the intestinal tract, and that the public health problem is in consequence mainly concerned with housing conditions, the provision of a pure and ample water-supply and an efficient drainage system, and the adoption of sound methods of conservancy and sewage disposal. In rural areas, on the other hand, the chief problem is the prevention and mitigation of epidemics of malaria, plague, small-pox and relapsing fever and the improvement of the water supply. Government agree that the distinction thus drawn between urban and rural problems of public health is in the main correct, but though it may be true that the principal measures required to remedy conditions of public health in rural areas are an expansion of the personnel of the Public Health Department, so as to permit of the wide extension of the precautionary and preventive measures necessary to combat epidemics, and the execution of large drainge and other schemes calculated to remedy the topographical features favourable to malaria, at the same time it cannot be forgotten that there is much in the sanitary conditions of villages which requires attention, and there can be no justification for neglecting them because the condition of towns may be worse. The Director of Public Health observes that it would serve no purpose to endeavour to dragoon the zamindar in advance of public opinion, but Government are not satisfied that any real attempt has ever been made so to educate public opinion as to make such dragooning unnecessary. In this connection it may be hoped that the organisation of panchayats under the Village Panchayat Act will provide a means of educating public opinion on the right lines. At present district boards are expected to take the initiative in schemes of rural sanitation, but the constitution of district boards is against their taking interest in the conditions of particular villages, and it is the elected governing bodies of the villages themselves that must be interested in measures designed to promote the health and comfort of their own constituents.

6. The progress made on existing lines during the year under report in tackling the problems of public health in towns was satisfactory, but in the case of villages this was not so. Water-supply projects estimated to cost over Rs. 30 lakhs were under construction in twelve towns, and large drainage projects estimated to cost nearly Rs. 16 lakhs were in hand in thirteen towns. As against this a scheme for improving the water-supply of rural areas in the Gurgaon district at a cost of about Rs. 56,000 was in the course of execution, and in some other districts trial borings were made with a view to discovering sources of water-supply. The Sanitary Engineer and his staff were fully occupied with these and other smaller works throughout the year, and are to be congratulated on the amount of work accomplished and the confidence with which their services are sought by local bodies.

7. Lieutenant-Colonel W. H. C. Forster continued to hold charge of the appointment of Director of Public Health for the first five months of the year and on his proceeding on leave was succeeded by Lieutenant-Colonel C. A. Gill, and Government desire to acknowledge the unflagging zeal with which they have discharged their duties. The department is still undermanned with only two out of the four sanctioned Assistant Directors, and the manner in which these officers have coped with their work has been highly creditable. The district public health agency was expanded by the appointment of two more District Health Officers and two more District Medical Officers of Health, and the combined cadre of district board and Government Health Offices by the end of the year numbered eighteen. The Director of Public Health records the excellent work done by a number of these officers and several of the Municipal Medical Officers of Health and Government desire to take this opportunity of acknowledging their services. The zeal and energy displayed by Major J. R. D. Webb, Medical Officer of Health of Simla, have already been noticed by Government; other officers who may be particularly mentioned are Dr. M. J. Thakor of Gurgaon, Dr. S. G. Rasul of Rohtak, Dr. Abdul Hamid of Sialkot and Gujranwala and Dr. Wazir Singh of Dera Ghazi Khan and Muzaffargarh. Mr. A. R. Astbury remained in charge of the post of Sanitary Engineer for the greater part of the year until his appointment in November as Chief Engineer and Secretary to Government, Public Works Department, Buildings and Roads Branch, when he was succeeded by Rai Bahadur Lala Amar Nath, Nanda. Mr. Astbury had held the appointment of Sanitary Engineer for nine years, and Government desire to place on record their high appreciation of the services he rendered in this capacity.

ORDER.—Ordered that copies of this review be circulated with the report and be furnished with the usual number of copies of the report to the Government of India, also that the review be published in the *Punjab Government Gazette*.

Ordered, also, that a copy be furnished to the Director of Public Health, Punjab, for information.

By order of the Punjab Government (Ministry of Education).

CHHOTU RAM,
Minister for Education.

J. G. BEAZLEY,
Secretary to Government, Punjab, Transferred Departments.

683 CS—391—31-8-25—SGPP Lahore.

SECTION I—Meteorology.

Meteorology.

1. The important influence exercised by meteorological conditions and more particularly by abnormal seasons upon the state of the public health in this Province has long been recognised and it is therefore customary to give some account of the chief meteorological features of the year in the Annual Public Health Report. During the period the miasmatic theory of the nature of disease held the field, the climatic circumstances of the year were considered in great detail, but in modern times, as the result of the discovery of the microbic nature of disease, the section dealing with meteorology has comprised a brief and formal account of the weather from the point of view of the professed meteorologist. The advance in knowledge made during recent years has however served to revive interest in medical meteorology and to throw a new light upon the part played by cyclical and seasonal variations in climatic conditions in determining the incidence of disease. It is in fact now possible to correlate in some measure meteorological circumstances with epidemiological happenings. It has thus been proved that in the Punjab excessive rainfall during the months of July and August—but not at other times—is a factor of great importance in determining the occurrence of epidemics of malaria. Again, it is now known that the weather conditions prevailing during the winter constitute one of the factors determining the severity of epidemics of plague during the ensuing spring.

During the year under review the rainfall during the months of July and August was approximately normal and in consequence no widespread epidemic of malaria occurred in the Province. On the other hand the meteorological circumstances prevailing during the winter were abnormal. In January and February 1924, as the result of a series of western disturbances, rainfall was everywhere abundant being as much as thrice the normal figure in the south-west of the Province. The weather during the spring was likewise abnormal, cold weather conditions, as the result of the six western disturbances, being continued in a remarkable manner throughout the months of April and May. As the result of these circumstances the atmospheric temperature during April and May was markedly below normal whilst the relative humidity was in considerable excess. These conditions provided an environment peculiarily favourable to the transmission of plague and it is largely on account of this circumstance that the Punjab was afflicted during the spring and early summer with one of the most serious and most prolonged epidemics of plague on record.

In the month of June, as the result of a heat wave of abnormal intensity (even for the Punjab), the atmospheric temperature soared high above normal whilst relative humidity was everywhere in large defect. Correlated with these meteorol ogical conditions the epidemic of plague subsided abruptly and, as it subsequently transpired, the disease disappeared permanently from many localities. The provincial rainfall in July and August was approximately normal save in a few localities where a slight excess was followed, as forecasted, by a mild outbreak of epidemic malaria. Towards the end of September, as the result of exceptionally heavy rainfall in the Simla Hills and adjacent plains (under the influence of a remarkable depression from the Bay of Bengal) extensive floods which occasioned some loss of life and grave damage to property, occurred in the riverain tract of the districts of Ambala, Karnal, Rohtak and Gurgaon. The study of the relation of rainfall to malaria had however shown that excessive rainfall and flooding at this season of the year was not likely to be followed by an epidemic of malaria—a view which was justified by the event -and the floods were not associated with or followed by a rise in mortality or an increase in sickness.

Economic conditions

2. A marked defect in the monsoon rainfall has scarcely less influence upon the vital statistics of the Punjab than an excess, for as the latter is apt to be associated with devastating epidemics of malaria, so the former occasions a rise in the death-rate either as the direct result of famine or indirectly by the influence of economic stress upon the stamina of the people. The spectre of famine however no longer hangs over the land—thanks to the introduction of the great irrigation

system, the network of railways and the organised system of famine relief—and economic conditions nowadays possess less significance from the point of view of the public health than formerly. It may however be mentioned that the average retail price of wheat per rupee during the year 1924 was $9\frac{1}{4}$ seers at Ambala, $8\frac{1}{2}$ seers at Lahore, $8\frac{7}{16}$ at Rawalpindi and $8\frac{1}{8}$ at Multan.

The corresponding rates for barley were $14\frac{9}{16}$ seers at Rawalpindi, $13\frac{3}{16}$ at Ambala, $12\frac{3}{16}$ seers at Lahore and $12\frac{7}{16}$ at Multan; of jowar 15, $11\frac{7}{8}$, $11\frac{1}{16}$ and $10\frac{7}{8}$ seers per rupee at Ambala, Rawalpindi, Multan and Lahore respectively.

The average price of bajra at Ambala, Lahore, Rawalpindi and Multan varied from $12\frac{1}{2}$ to $10\frac{5}{16}$ seers per rupee; of maize from $13\frac{5}{8}$ to $10\frac{5}{8}$ and of gram from $14\frac{3}{8}$ to $11\frac{7}{16}$ seers per rupee.

These figures represent a small rise in prices as compared with the year 1923 but the slight increase in the cost of living, associated as it was with an increase in exports, is not incompatible with the statement that the economic conditions prevailing during the year were favourable to health.

Section V—Vital Statistics.

Population.

3. The population enumerated on March 1921 (20,517,606) has been taken as the basis upon which all birth and death-rates mentioned in this report have been calculated. The estimated population on the 31st December 1924, calculated according to the usual method, was 21,226,467 (11,598,363 males and 9,628,104 females) which thus indicates that the population has increased by 708,861 since March 1921. The estimated increase in population on 31st December 1923 was however 778,202 which thus indicates that in the year 1924 the normal "natural increase" in the population was replaced by an abnormal and unnatural decrease, the cause of which, as will be shown later, was the mortality occasioned by a great epidemic of plague and in less degree by an epidemic of relapsing fever. Calculated on the estimated population the birth-rate is 38·7, *i.e.* 1·4 *per mille* less than the rate based upon the census figures, and similarly the death-rate is 42·0 *per mille* or 1·4 less than the figures based upon the census population, all districts exhibiting a decrease with the exception of Kangra and Gujrat.

General Review.

4. After five relatively healthy years the year 1924 was characterised by extreme unhealthiness, the death-rate being nearly four times that of the United Kingdom and 16·08 *per mille* in excess of the provincial death-rate during the preceding five years. The provincial death-rate during the year 1924, which was 43·43 *per mille*, greatly exceeded that of any other province in India, the figures in order of magnitude being as follows :—

Punjab, 43·43; Central Provinces, 32·59; North-West Frontier Province, 31·0; Bihar and Orissa, 29·1; United Provinces, 28·29; Bombay, 27·63; Assam, 27·30; Bengal, 25·86; Madras, 24·53; and Burma, 21·50.

The death-rate under the various heads of mortality together with the average figures for the previous quinquennium (1919–1923) are shown in Table 1.

Table I.

Year.	Cholera.	Small-pox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory Diseases.	Injuries.	All other causes.	Total death-rate.
1924	0·16	0·20	12·24	22·04	0·58	2·66	0·32	5·23	43·43
1919—1923	0·27	0·32	0·76	18·39	0·47	2·19	0·32	4·63	27·35
Increase or decrease in 1924	−0·11	−0·12	+11·48	+3·65	+0·11	+0·47	*Nil.*	+0·60	+16·08

From a scrutiny of the figures given in Table I it is clear that the main cause of the abnormal death-rate in the year under review was plague and "fevers" which are 11·48 and 3·65 *per mille* respectively above the quinquennial mean figures.

But the high death-rate was associated with a high birth-rate, the provincial figure being 40·1 *per mille* as compared with an average birth-rate of 40·5 *per mille* during the preceding quinquennium and 43·2 *per mille* during the preceding year. Owing to the high death-rate there was an excess of 69,341 (3·3 *per mille*) of deaths over births, a circumstance which necessitates the statement that in the year 1924 the state of the public health was far from satisfactory.

The consistently high birth-rate of the Punjab—about twice that of the United Kingdom—in spite of its high death-rate (due to the frequency and severity of epidemic visitations) is nevertheless an encouraging sign since it indicates that the severe epidemics to which the Province is liable exercise little or no permanent effect upon the virility and recuperative power of its inhabitants. The Punjab, in fact, in spite of the fact that it usually exhibits a death-rate higher than that of any other Province, frequently returns the highest birth-rate. During the year under review the Central Provinces showed the highest birth-rate (44·18), the Punjab coming second (40·1) followed by Bihar and Orissa, (35·7); Bombay, (35·60); Madras, (34·89); United Provinces, (34·72); Assam, (31·04); Bengal, (29·45); Burma, (27·40) and the North-Western Frontier Province (27·0).

The Provincial birth-rate—Annual Form No. 1.

5. **Births.**—The total number of births registered during the year was 821,685 or 40·1 *per mille* of which 435,765 (21·2 *per mille*) were males and 385,920 (18·8 *per mille*) females, the corresponding figures for the year 1923 being 885,587 (43·2 *per mille*) of which 468,186 (22·8 *per mille*) were males and 417,401 (20·3 *per mille*) were females. The male birth-rate therefore, as usual, exceeded the female birth-rate, the difference during the year under review being 2·4 *per mille*. The number of males born to every 100 females was 112·9 as compared with 111·9 during the previous quinquennium and 112·2 during the preceding year.

The number of births during the year under report was 0·4 *per mille* less than the mean figure for the preceding five years and 63,902 or 3·1 *per mille* less than in the previous year. The usual cause of a reduction in the birth-rate in the Punjab is an epidemic of malaria whose influence is reflected in the birth-rate the year *following* the epidemic, whilst other epidemic diseases such as plague and relapsing fever affect the birth-rate of *the year in which they occur*. The decrease in the birth-rate in 1924 is attributable to epidemics of malaria, plague, and relapsing fever, the epidemic of malaria being that which took place in the autumn of 1923, whilst the severe epidemics of plague and relapsing fever in the year under report, by causing the death of many women of child-bearing age, also exercised an appreciable influence in lowering the birth-rate.

The district birth-rate.

6. Comparing the total birth-rate of districts (including municipal towns) in 1924 with the corresponding figure for the *previous five years* fourteen districts showed a birth-rate below the mean, the decrease being most marked in Lahore (4·6); Sialkot and Gujranwala (4·1); Rohtak (2·5); Lyallpur (2·3); and Karnal and Gujrat (2·2), the first four of which and the last being the districts showing an extremely high mortality from plague, whilst Karnal was afflicted by malaria in the autumn of 1923 and by plague in the spring of 1924.

Fifteen districts exhibited an increase in the birth-rate as compared with the mean quinquennial figure, the increase being marked in the districts of Simla (5·4), Gurgaon (3·9) and Montgomery (3·8), all of which remained relatively free from epidemic visitations during the past two years.

The district birth-rates showed almost everywhere a decrease as compared with the figures for *the preceding year*, the exceptions being the few districts that were not involved in epidemics of plague, malaria or relapsing fever. The decrease was most marked in Gujranwala, (8·9); Gujrat, (6·8); Dera Ghazi Khan, (5·6); Amritsar, (5·0); Jhang, (5·0) and Jhelum, (4·8).

Fourteen districts exhibited a birth-rate higher than *the provincial mean figure* (40·1). Gurgaon, again, exhibited the highest birth-rate of any district in the Province (49·6), thus suggesting that this district is rapidly recovering from the effect of unfavourable economic conditions and epidemic visitations during the last decade. Other districts exhibiting a high birth-rate are Lyallpur, (45·7); Amritsar, (44·7); Jullundur, (44·5); Hoshiarpur, (43·8); Gurdaspur, (43·6) and Montgomery, (43·0).

Simla (as usual) exhibited the lowest birth-rate (25·8), but the exceptional conditions associated with the fluctuating population of Simla Municipality render it impossible to attach much significance to the vital statistics of this small district. Other districts exhibiting a birth-rate below the provincial mean were Dera Ghazi Khan, (30·3); Muzaffargarh, (34·3); Sheikhupura, (34·6); Gujrat, (35·4); Ferozepore, (35·5) and Lahore, (36·3).

7. The profound effect of the epidemic of plague upon the birth-rate is illustrated by the fact that, whereas in 1922 and 1923 the excess of *births* over *deaths* was equivalent to 17·2 *per mille* and 12·3 *per mille* respectively of the census population, in the year under report the excess of *deaths* over *births* was equal to 3·3 *per mille* of population. The deaths exceeded the births in eleven districts, being most marked, as would be anticipated, in those districts where plague was most severe. Thus in Gujrat, which suffered more severely from plague than any other district (65,238 deaths), the excess of deaths over births was equal to no less than 66·7 *per mille*, in Rohtak to 33·0 *per mille*, in Gujranwala to 28·6 *per mille* and in Sialkot to 24·4 *per mille*.

On the other hand 18 districts exhibited an excess of births over deaths, the excess being most marked in Gurgaon (16·6) and Jullundur (14·2) neither of which was seriously affected by plague or by other epidemic disease.

The Urban birth-rate.

8. The birth-rate of the 45 towns of the Province with a population of 10,000 or upwards was 41·2 *per mille* as compared with a mean birth-rate of 43·9 during *the previous five year* and 42·7 during the *preceding year*. The birth-rate of the cities of Amritsar, Multan and Lahore was 54, 45 and 34 *per mille* respectively as compared with 46, 44 and 34 *per mille* respectively in the preceding quinquennium and 51, 46 and 37 *per mille* in the year 1923.

Annual Form No. VI-B.

The birth-rate of the 158 municipal towns was 40·37 *per mille* as compared with 42·00 *per mille* during the preceding year. It was thus slightly higher than the provincial mean figure (40·1) which is attributable to the fact that the large towns (except Lahore) escaped relatively lightly in the epidemics of plague and relapsing fever.

The rural birth-rate. Annual Form VI-A.

9. The birth-rate in rural areas (excluding the 158 towns) was 40·0 *per mille* as compared with a mean birth-rate of 41·4 during *the previous five years* and 43·3 during *the preceding year*.

The districts (rural areas) showing the highest birth-rates were Gurgaon, (49·61); Lyallpur, (46·61); Jullundur, (44·15); Hoshiarpur, (44·13); Montgomery, (43·64); Gurdaspur, (43·46); Mianwali, (43·04); Amritsar, (43·00); Ludhiana, (42·85); Multan, (42·84); Jhang, (42·05); Rohtak, (41·38) and Hissar, (40·56).

The Provincial death-rate. Annual Form No. II.

10. Deaths.—The total number of deaths registered during the year was 891,026 (43·4 *per mille*), of which 457,758 (40·3 *per mille*) were males and 433,268 (46·5 *per mille*) were females, the corresponding figures for the year 1923 being 634,862 (30·9 *per mille*), 328,845 (29·4 *per mille*) males and 306,017 (32·9 *per mille*) females, whilst the corresponding rates during the previous five years were 27·4, 26·6 and 28·2 *per mille* respectively.

The female death-rate was, as usual, higher than the male death-rate, but the abnormal excess in the female over the male death-rate in 1924 (5·6 *per mille*) as compared with 1·6 *per mille* in the preceding five years is attribut-

able to the peculiar liability of females (as the result of their domesticated habits) to contract plague. Nevertheless owing to the fact that there are nearly two million more males than females in the Punjab the number of deaths of males to every 100 deaths of females was 105·7 as compared with 107·5 in the previous year.

The provincial mortality, which was 16·08 *per mille* in excess of the mean annual death-rate during *the previous five years* and 12·49 *per mille* in excess of the figure for *the previous year*, comprised 3,351 deaths from cholera (0·16 *per mille*) ; 4,040 deaths from small-pox (0·20 *per mille*); 251,261 deaths from plague, (12·24 *per mille*) ; 452,127 deaths from " fevers ", (22·04 *per mille*); 11,817 deaths from dysentery and diarrhœa (0·58 *per mille*) ; 54,488 deaths (2·66 *per mille*) from respiratory diseases ; 6498 deaths (0·32) from injuries and 107,384 deaths (5·23 *per mille*) from " all other causes."

The excess in the mortality during the year under review as compared with the quinquennial mean figure (*vide* Table I) is almost entirely attributable to plague and " fevers."

The district death-rate. Annual Form No. II.

11. Comparing the death-rate of districts in 1924 with the corresponding mean figures for *the previous five years*, 27 districts showed a death-rate *above* the mean, the increase being most marked in the districts of Gujrat, (+77·2); Rohtak, (+45·3); Gujranwala, (+39·9); Sheikhupura, (+33·2); Sialkot, (+33·1) ; and Lahore, (+25·1), all of which suffered severely from plague. Two districts, *viz.*, Simla and Kangra, exhibited a death-rate *below* the quinquennial mean figure, these being districts in which neither plague nor relapsing fever prevailed in epidemic form. As compared with *the previous year* the district death-rate showed an excess in 24 districts more especially in Gujrat, (+76·3) ; Rohtak, (+43·0) ; Gujranwala, (+30·8) ; Sheikhupura, (+28·3) ; Lahore, (+21·0), and Shahpur, (+16·6).

The relative incidence of mortality in the various districts of the province is indicated by the fact that in eight districts the death-rate was *above the provincial mean figure* (43·4) ; those exhibiting the highest death-rate being Gujrat, (102·1) ; Rohtak, (74·5) ; Gujranwala, (67·2) and Sialkot, (65·1). Twenty-one districts showed a death-rate below the provincial mean figure, the most conspicuous being Simla, (19·5) ; Jullundur, (30·3) ; Ferozepore; (31·0) and Ludhiana, (31·3).

It is a matter of considerable practical importance to administrators in general and to sanitarians in particular to know the relative healthiness of the different districts of the Punjab ; but, as for various reasons, the construction of life tables is not feasible, and since it is difficult to appraise the relative salubrity of districts by reference to their respective birth and death-rates owing to the fluctuations associated with severe but evanescent epidemics, it is not easy to give a definite reply to the question which is the most healthy or the most unhealthy district in the Province ?

It is thought, however, that the " longevity index " affords assistance in framing an answer to this question. This figure, (*vide* Appendix F.) which represents the number of persons of and over 60 years of age per 10,000 of population in each district, indicates the number of individuals who reach or approach the allotted span in spite of the sudden calamity of epidemics or the less conspicuous but not less inimical influence upon longevity of chronic disease and adverse economic conditions. It is not desirable that undue importance should be attached to this index, but it is pertinent to remark that whilst the three districts showing the highest and lowest longevity indices (*vide* Appendix F) are Hoshiarpur, Jullundur and Jhelum and Gurgaon, Simla and Karnal, respectively, it had provisionally been concluded on general grounds that Jullundur and Hoshiarpur were amongst the healthiest districts and that Karnal and Gurgaon were the most unhealthy districts in the Punjab.

The Urban death-rate. Annual Form No. VI-B.

12. The death-rate in the 158 towns was 39·82 *per mille* as compared with 29·64 *per mille* during *the preceding five years* and 32·50 *per mille* in *the previous year*, the increase over the quinquennial mean figure being equal to 10·18 *per mille* of population.

The rates recorded in the three cities of the Province were Lahore, 45·06, Amritsar, 43·51 and Multan, 37·08 as compared with 29·73, 34·42, and 33·59 during *the preceding five years* and 34·11, 36·64, and 28·18 in *the preceding year*. The high death-rate in Lahore city was largely due to plague.

Some of the smaller towns, many of which resemble villages in all but name, exhibited extraordinary death-rates, *viz.*, Kunjah, (145·72) ; Ram Nagar, (117·23) ; Gohana, (97·90) ; Pattoki Mandi, (94·37) ; Badomali, (92·66) ; Hafizabad, (92·24) ; Mitranwali, (90·34) ; Dajal, (88·31) ; Jalalpur Jattan, (84·41) ; Daud, (76·10) ; Chunian, (71·32) ; Khudian, (69·08) ; Jhajjar, (68·06); Sonepat, (67·18) ; Sharakpur, (66·63) ; Miani, (Shahpur District), (64·04) ; Baghbanpura Bhogiwal, (62·73) ; Shahpur, (61·22) ; and Beri, (60·91). With the exception of Dajal, where the high death-rate was due to relapsing fever, plague was mainly responsible for these high figures but in Khudian, malaria and, in Pattoki, cholera also helped to swell the death-rate.

The rural death-rate. Annual Form No. VI-A.

13. The rural death-rate was 43·83 *per mille* in 1924 as compared with 27·10 *per mille* in *the preceding quinquennium* and 39·77 *per mille* in *the previous year*, the excess in the year under report over the quinquennial mean figure being equal to 16·73 *per mille* of population.

The death-rate in eight districts exceeded the mean, those districts, (rural areas) exhibiting the highest death-rates being Gujrat, (103·71) Rohtak, (76·11) ; Gujranwala, (69·82) ; Sialkot, (67·81) ; Sheikhupura, (53·94) and Lahore, (52·08), the cause again being mainly plague.

It will be observed that the excess in the rural death-rate in 1924 over the quinquennial mean figure (+16·73) was considerably greater than in the case of urban death-rate which exhibited an excess in the year under report of 10·18 *per mille*. This circumstance is due to the fact that plague exacted a heavier toll in villages than in towns. It may also be remarked that the urban death-rate is usually higher than the rural death-rate, the figures for the last quinquennium being 29·64 and 27·10, respectively, but in the year under report, as the result of plague, the situation is reversed and the rural death-rate is 4·01 *per mille* in excess of the urban death-rate.

Seasonal mortality. Annual Form No. III.

14. The seasonal incidence of mortality in the Punjab varies in accordance with the "epidemic constitution" of the year. The "reigning epidemic"—to use a term employed by Sydenham—in the year under review being plague, which reaches its maximum intensity during the spring and early summer, the second instead of the fourth quarter (which is the more usual) of the year, exhibited the highest death-rate, the death-rate during the four quarters of the year being 10·76, 15·56, 6·91 and 10·19 respectively.

The unhealthiest month was April at which period the plague epidemic reached its maximum intensity, but the death-rate in May (5·65) ; March, (4·65) and June (3·53) was also abnormally high as the result of plague.

The month of August with a death-rate of 1·93 was the healthiest month of the year, next in order coming July, (2·46) ; September, (2·52) ; February, (3·00) ; January, (3·11) ; October, (3·25) ; December, (3·46) ; and November (3·48).

Age of mortality. Annual Form No. IV.

15. The population of the three age-groups under one year is not known and the actual number of deaths in these age-groups can alone be given.

Amongst infants *not exceeding one month in age*, the total mortality was 76,378 (41,274 males and 35,104 females) as compared with 81,377 (43,606 males and 37,771 females) in *the previous year*. The districts of Jullundur (4,705) ; Lahore, (4,089) ; Lyallpur (4,046) ; and Gurdaspur (4,011) exhibited the largest number of deaths of infants during the first month of life.

It is a peculiar fact that Jullundur District almost invariably returns the largest number of deaths of infants during the first month of life,—but not at other ages—and it is likewise noteworthy that, whilst it is usual in all

countries for male deaths to outnumber female deaths at this age-period, in Jullundur District the female deaths usually equal or exceed the male deaths. In 1921 Jullundur was the sole district in the Province in which the female exceeded the male deaths at this age-period, whilst in the year under review the figures are nearly equal, the female deaths actually exceeding the male deaths in the case of Hindus. The above point is worthy of mention because the practice of female infanticide was formerly reported to prevail in Jullundur District.

In the case of children *over one month and not exceeding six months in age*, the mortality amounted to 49,224 (26,024 males and 23,200 females) as compared with 48,414 (25,836 males and 22,578 females) in *the preceding year*. The districts recording the largest number of deaths in this age-group were Karnal, (2,702); Amritsar, (2,618); Lahore, (2,515); Sialkot, (2,350); Hoshiarpur, (2,276) and Multan, (2,214).

In children *over six months and under twelve months*, the mortality amounted to 49,060 (25,845 males and 23,215 females) as compared with 44,335 (23,461 males and 20,874 females) in *the preceding year*. The districts of Amritsar, (2,884); Sialkot, (2,830); Lahore, (2,717); Shahpur, (2,590); Gurdaspur, (2,579); and Lyallpur, (2,578) were responsible for the largest number of deaths.

In the case of *infants under one year in age*, the total mortality was 174,662 showing an increase of 20,588 as compared with the *quinquennial mean figures* and of 536 as compared with the preceding year. The death-rate is 209·57 *per mille* of census population as compared with 184·86 *per mille* in the *preceding five years* and 208·92 *per mille* in the preceding year. The infantile mortality-rate or the number of deaths per 1,000 births in the year under review was 212·57 (21·375 males and 211·23 females) as compared with 185·28 (187·83 males and 182·43 females) during the preceding quinquennium and 196·62 (198·43 males and 194·59 females) in *the previous year*.

The death-rate *per mille* of population of males and females in each age group during the years 1922, 1923 and 1924 is given in Table II.

TABLE II.

Age.	1922.		1923.		1924.		Number of times the death-rate in 1924 exceeded death-rate in 1922.
	Males.	Females.	Males.	Females	Males.	Females.	
Under one year	169·99	152·37	218·61	198·84	219·18	199·57	1·3
1 and under 5 years	39·57	38·02	58·87	59·39	68·21	68·85	1·8
5 „ 10 „	7·43	7·76	11·23	13·11	20·01	24·28	2·9
10 „ 15 „	6·51	8·13	10·24	14·25	21·29	31·69	3·6
15 „ 20 „	7·60	10·03	11·98	16·61	25·82	35·06	3·4
20 „ 30 „	7·88	10·02	11·58	14·94	20·58	24·90	2·5
30 „ 40 „	9·83	11·76	13·57	17·20	24·32	29·56	2·5
40 „ 50 „	14·75	14·72	20·06	21·98	34·00	38·02	2·4
50 „ 60 „	21·09	20·30	28·03	29·45	46·85	51·17	2·4
60 and upwards	50·41	52·06	61·08	68·65	80·52	90·84	1·7

The figures given in Table II show that the death-rate in every age-group during the year 1924 was higher than in the preceding year and much higher than in the year 1922.

In the latter year (1922) neither plague nor malaria occurred in epidemic form and the figures for this year represent with approximate accuracy the age distribution of mortality in a normal year. By dividing the death-rate in 1922 of each age-group into the corresponding figure for the year 1924 the figures given in the last column of Table II are obtained. It will be seen that the greatest relative increase in the death-rate occurred, in order of magnitude, in the age-groups 10-15, 15-20 and 5-10. It will also be seen that the death-rate of females belonging to the 10-15 and 15-20 age-groups was disproportionately high, these facts being indicative of the selective influence of plague upon adolescents and young adults and more especially upon young females.

16. The death-rate amongst the different religions and classes was as follows :—

Death-rate by classes. Annual Form No. IV.

	Total	*Male.*	*Female.*
Muhammadans ...	47·61	45·01	50·66
Hindus	37·81	35·41	40·73
Indian Christians ...	43·71	41·42	46·49
Other Classes ...	130·72	93·78	222·80

Hindus usually exhibit a slightly lower death-rate than other classes but the excess in the Muhammadan over the Hindu death-rate in the year under review was 9·80 as compared with 2·01 in the previous year. This circumstance is accounted for by the fact that the towns (in which contain a relatively high proportion of Hindus population reside) were less affected by plague than the rural areas in which Muhammadans are in relative and absolute excess.

The death-rate in children under one year of age in the case of Muhammadans was 216·08 *per mille* (males 227·97 and females 203·80) as compared with 201·65 (males 209·00 and females 193·97) in the case of Hindus and 162·39 (males 166·22 and females 158·40) in the case of Indian Christians.

17. During the year under review 677,992 entries in birth registers and 561,380 entries in death registers were checked mainly by the Vaccination and Revenue Staff, these figures representing an increase of 245,723 entries as compared with the previous year.

Inspection of Birth and Death Registers.

The omissions detected by the Superintendents of Vaccination and Vaccinators in the birth registers was 1·74 per cent. in the case of male births and 1·90 per cent. in the case of female births whilst the omissions in the death registers were 1·10 per cent. in the case of male deaths and 1·22 per cent. in the case of female deaths.

The highest number of omissions was discovered in the districts of Gujrat, Mianwali, Dera Ghazi Khan, Montgomery, Ferozepore, Multan, Shahpur and Ambala. The percentage of omissions detected by revenue officials was 2·13 in the case of male births and 1·83 in the case of female births. The number of entries checked by Tahsildars and Naib-Tahsildars shows a decrease of 3,445 as compared with the figures of the previous year. Only 27 chowkidars were fined for neglecting to report births and deaths, the fines inflicted aggregating Rs. 37. In Municipal towns 108 persons were fined for failing to register births and 59 for failing to register deaths, but the fines inflicted only amounted to Rs. 105. The accuracy of the returns referring to births and deaths is a matter of vital importance, but unless this fact is realised by the civil officers whose duty it is to check these registers and unless defaulters are adequately punished it is difficult to effect any appreciable improvement in these returns.

Infectious Diseases Reports.

18. The prompt submission of reports regarding the outbreak of disease is of scarcely less importance than accurate registration. In order to effect an improvement in the both respects Government decided, as mentioned in the report for 1923, to make patwaris in the Lahore Division responsible for the maintenance of the birth and death registers and for reporting the occurrence of infectious diseases. The question of extending this system to all divisions of the Province and of effecting certain other changes that will enable District Health Officers to maintain direct touch with patwaris is now under the consideration of Government.

In the case of rural areas the *prompt* reporting of outbreaks of epidemics and of rat mortality is all that can at present be reasonably expected, but in the case of Municipal towns—more especially those towns where a Medical Officer of Health is employed—complete and accurate statistics should be available in regard to the incidence of such diseases as plague, cholera, small-pox, pulmonary tuberculosis, enteric fever and diphtheria, but the humiliating confession must be made that the true incidence of these diseases is quite unknown. A statement showing the number of infectious diseases notified in the eight Municipal towns where Medical Officers of Health are employed are shown in Appendix G. Since knowledge of the existence of an evil constitutes the first step towards its mitigation proposals have been placed before Government which it is hoped will lead to a great improvement in the notification of infectious diseases—more especially those already notifiable under the Punjab Municipal Act—in Municipal towns.

Births and deaths amongst railway employes.

19. During the year 1924, 51 births and 34 deaths were recorded at railway stations outside municipal limits against 33 and 21 respectively in the preceding year. The reported cause of death was "fevers", 24; "all other causes", 4; respiratory diseases, 3; cholera, 1; dysentery and diarrhœa, 1 and injuries, 1.

Births and deaths amongst Europeans and Anglo-Indians.

20. There were 347 births and 118 deaths amongst Europeans and Anglo-Indians during the year as against 336 and 115 respectively last year. Respiratory diseases accounted for 18 deaths, "fevers", 13; plague, 3; dysentery and diarrhœa, 2; cholera, 1; injuries, 1; and "all other causes," 80.

Births and deaths amongst the non-military population of cantonments.

21. There were 3,999 births (28 *per mille*) and 3,340 deaths (24 *per mille*) amongst the non-military population of cantonments which constitute a decrease of 296 in the former and an increase of 311 in the the latter as compared with the previous year. The deaths were classified as follows :—

"Fevers", 1,577; all other causes, 874; respiratory diseases, 494; plague, 195; dysentery and diarrhœa, 120; injuries, 70; cholera, 6 and small-pox, 4.

Section VI—Chief Diseases.

Annual Form No. VII.

22. **Cholera.**—After two years of almost complete freedom from cholera, the incidence of this disease in the year under review underwent a moderate increase, the total number of recorded cases and deaths being 4,118 and 3,351 respectively, as compared with 25 cases and 11 deaths in the previous year and 287 cases and 128 deaths in the year 1922. The mortality-rate was 0·16 *per mille* in the year under report, as compared with an average mortality rate of 0·27 *per mille* during the preceding five years. But although no widespread epidemic took place the disease prevailed in 24 out of 29 districts, those mainly affected in order of severity being Lahore, (1,397 deaths); Sialkot, (399 deaths), Lyallpur, (378 deaths); Ferozepore, (224 deaths); Montgomery, (201 deaths); Amritsar, (191 deaths); and Gurdaspur, (117 deaths). The districts of Hissar, Rohtak, Simla, Mianwali and Dera Ghazi Khan remained free from cholera throughout the year. The number of towns infected with cholera was 56 out

of 158, but this figure does not take into account the important part played by towns in disseminating the disease in surrounding rural areas.

The towns chiefly affected were Amritsar City, (175 cases and 152 deaths); Kasur, (191 cases and 145 deaths); Lahore City, (163 cases and 131 deaths); Pattoki Mandi, (103 cases and 92 deaths); Rawalpindi, (46 cases and 30 deaths); Jagraon, (38 cases and 28 deaths); Patti, (36 cases and 27 deaths) and Wazirabad, (34 cases and 24 deaths).

As the case-mortality of cholera is almost constantly about 50 per cent. the above figures suggest that the reporting of *cases* was seriously defective.

The seasonal incidence of the disease was normal; the majority of deaths occurred in the months of July, (676 deaths); August, (1,216 deaths); and September, (1,275 deaths). The figures for the other months being February, (1 death); March, (1 death); April, (4 deaths); May, (18 deaths); June, (38 deaths); October, (118 deaths) and November, (4 deaths).

As in previous years the part played by pilgrims from Hardwar and other religious centres in the United Provinces in spreading cholera in the Punjab was considerable. In the earlier outbreaks (when the source of infection was readily traced) Hardwar was definitely implicated in a considerable number of instances. Sometimes the disease developed in pilgrims during the return journey but more often shortly after arrival. In a few instances the pilgrims themselves escaped infection, but the disease appeared amongst their friends and neighbours amongst whom, according to custom, they had distributed sweetmeats brought from Hardwar.

The source of infection was not however traceable in all outbreaks, but it is of interest to note, as suggesting the part played by Hindu pilgrims, that during the earlier stages of the epidemic the disease was almost exclusively confined to Hindus.

The primary foci usually gave rise to secondary centres of infection and the cities of Lahore and Amritsar and the towns of Kasur and Pattoki Mandi were, in particular, responsible for the spread of infection to many villages in their vicinity. The character of the outbreaks rarely suggested the massive infection of water supplies; on the other hand the infected individuals were often confined to those persons who partook of food or water in a house where an imported case of cholera had recently occurred.

Owing to the unusual prevalence of cholera during the early part of the year in Bihar and Orissa and in the United Provinces it was anticipated that cholera would be more prevalent than usual in the Punjab and all officers of the Public Health Department were therefore warned to keep a vigilant watch over pilgrims, to take steps to ensure the prompt reporting of outbreaks and to adopt stringent measures to prevent the spread of infection from the primary cases.

Steps were also taken to encourage anti-cholera inoculation, to provide for the treatment of cholera by modern methods, to open cholera depôts in rural areas and last but not least to spread knowledge in regard to the cause and mode of spread and means of prevention of cholera by means of leaflets and lantern lectures. The measures taken on these lines were attended with considerable measure of success and it cannot be doubted that the prompt action taken by officers of the Public Health Department was in many instances successful in stamping out infection. On the other hand, either as the result of failure to report promptly the appearance of cholera or to delay in reaching infected localities—in some cases attributable to the fact that one District Health Officer held charge of two districts—several outbreaks of considerable magnitude ensued. Anti-cholera inoculation and the treatment of cholera by hyper-tonic salines (as devised by Sir Leonard Rogers) were not extensively practised, but, where adopted, were reported to have yielded good results.

This epidemic taught no new lesson, but it emphasised the fact that the successful prevention of cholera in this Province depends largely upon the prompt receipt of reports and upon immediate action in dealing with the

primary cases, for once the disease has assumed epidemic proportions, preventive measures present great and often insuperable difficulties. The close dependence of the epidemic upon importation from neighbouring Provinces, which suggests that regulations framed under the Epidemic Diseases Act (1897) would prove of great value, was once more apparent. It was likewise clear that close co-operation between the Railway Administration and the Public Health Department was a matter of vital importance.

23. **Small-pox**.—The recorded mortality from small-pox during the year under report was 4,040 as compared with an average annual mortality of 6,601 during the preceding five years and 2,140 deaths during the preceding year. The small-pox death-rate in 1924 was 0·20 *per mille* as compared with an average death-rate of 0·32 *per mille* during the preceding five years and 0·10 during the previous year.

Annual Form No. VIII.

Although the small-pox death-rate was double that of the preceding year it was still 0·12 *per mille* less than the average annual mortality during the preceding five years; nevertheless, it is not possible to claim that the relatively low death-rate in the year under report was due to the more general adoption of vaccination during the preceding quinquennium and it must be concluded that the low incidence of the disease during the past two years is mainly attributable to circumstances connected with its cyclical periodicity. As small-pox has recently assumed serious proportions in certain Provinces of India it is to be feared that the opposition to vaccination (now happily less marked than formerly) associated with the non-co-operation movement—since the evil that men do lives after them—may be reflected in the small-pox statistics of the coming year. No figures are unfortunately available in regard to the number of *cases* of small-pox as, even in municipal towns where notification is compulsory, small-pox is rarely reported unless death occurs. Efforts to improve matters have so far proved of little avail and consequently the control of the disease is attended with the great difficulty.

All districts, except Simla, were infected with small-pox during the year. The districts in which the death-rate was above the provincial mean figure (0·20 *per mille*) were Jhelum, (0·61); Hoshiarpur, (0·59); Amritsar, (0·50); Jullundur, (0·36); Montgomery, (0·36); Lyallpur, (0·30); Ludhiana, (0·26); Hissar, (0·24); Lahore, (0·24) and Gurgaon, (0·21).

Out of the 4,040 deaths from small-pox, 1,154 or 28 per cent. occurred in children under one year of age as compared with 617 (28 per cent.) in the preceding year. In the case of children over one year and under ten years of age the number of deaths was 2,173 (53 per cent.) as compared with 1,083 (50 per cent.) in the preceding year. The total number of deaths from small-pox in children under ten years of age was 3,327 (82 per cent.) as compared with 1,700 (80 per cent.) in the previous year. These figures indicate that many children escape primary vaccination and they imply a needless waste of infant life. The male and female death-rate was as usual nearly equal, the rates in 1924 being 0·19 in males and 0·20 in females as compared with 0·11 and 0·10 respectively in the preceding year.

As regards seasonal prevalence the disease was present in every month of the year, but it exhibited the normal seasonal fluctuation, the mortality being greatest in the months of May (583 deaths) and June (580 deaths).

Small-pox is, as already stated, normally more prevalent in towns than in rural areas and the year 1924 proved no exception to the rule since the urban death-rate was 0·49 *per mille* as compared with 0·16 *per mille* in the rural areas. The average small-pox death-rate in towns in which the Vaccination Act is in force (but rarely enforced) was 0·41 *per mille* which is more than twice as great as the provincial figure and 0·10 *per mille* in excess of the corresponding figure of the previous year. In Amritsar City the small-pox death-rate was 1·28 *per mille*, in Lahore 0·27 *per mille* and in Multan 0·44, the corresponding figures for the previous year being 0·28, 0·54 and 0·35 *per mille*, respectively. The constantly high small-pox death-rate in the large cities, more especially in Lahore and Amritsar is an unsatisfactory feature for which a remedy has yet to be found. Out of the 158 towns, 82 reported deaths from

small-pox. Some of the smaller towns suffered even more than the cities, the death-rate in Pind Dadan Khan being 7·86, in Ramnagar, 7·12 ; in Miani, (Hoshiarpur District), 5·47 ; Nakodar, 4·88 ; Dasuya, 4·37 ; Miani, (Shahpur district), 3·35 ; Tanda Urmar, 3·23 and Hansi, 3·11.

The progress made in vaccination during the year under review will be dealt with in the Vaccination Report and it therefore need not be referred to here

Annual Form No. XII and Statement No. 1.

24. Plague.—Plague dominated the pathology of the Punjab during the year 1924 in a manner almost without precedent. Not only was the epidemic of far greater severity in the Punjab than in any other Province of India, but no epidemic of equal intensity has occurred in this Province for 17 years ; in fact, on three occasions alone since the first appearance of plague in the year 1898, namely in 1904, 1905 and 1907, has the Punjab experienced a visitation of greater magnitude. A brief *résumé* of the history of plague during the past 25 years was given in the Annual Report of last year wherein it was stated that, since the incidence of plague during the past five lustra had exhibited a steady decline, it was justifiable to assume that the present cycle of plague was on the wane ; nevertheless, it was added, a slow general decline is not inconsistent with the occasional occurrence of epidemics of considerable magnitude and severity. The plague history of the year under report fully justifies the latter statement but it renders it necessary to adopt an attitude of extreme caution in regard to the future history of the disease in this Province. The recorded mortality from plague in the year under report was 259,319 (251,261 in British districts and 8,049 in Indian States), the figure of British districts being equal to a death-rate of 12·24 *per mille* as compared with an average annual death-rate of 0·76 *per mille* during the preceding five years. No reliable figures can be given in regard to the number of *cases* of plague but since the case mortality is about 50 per cent. it is permissible to assume that half a million out of a total population of 20 millions suffered from plague during the year under review.

Distribution.—With the exception of Simla, Kangra, Dera Ghazi Khan Muzaffargarh and Mianwali (where a few imported cases alone occurred) all districts of the Province were involved in the epidemic, those severely infected being mainly the sub-montane districts in the Lahore and Rawalpindi Divisions. The intensity of the epidemic was greatest in Gujrat District where the recorded plague mortality reached the appalling figure of 65,238 or 79·17 *per mille* of the population. Other severely infected districts were Rohtak, 33,639 deaths (43·56 *per mille*) ; Sialkot, 29,648 deaths (34·12 *per mille*) ; Gujranwala, 22,202 deaths (35·60 *per mille*) ; Lahore, 21,121 deaths (18·91 *per mille*) ; Sheikhupura, 17,961 deaths (28·58 *per mille*) ; Shahpur, 10,159 deaths (14·11 *per mille*) and Jhelum, 8,819 deaths (18·54 *per mille*).

The disease was, as usual, more severe in rural areas than in towns, the urban and rural plague death-rates being 6·86 and 12·85 *per mille* respectively as compared with an average annual plague death-rate of 4·73 and 6·53 in urban and rural areas respectively during the period 1901—1921.

The three cities of the Province and more especially Lahore all experienced severe visitations of plague, the plague death-rate in Lahore, Amritsar and Multan being 7·00, 1·00 and 1·59 *per mille* respectively.

Seasonal Incidence.—As the result of a recrudescence of the disease at the end of the year 1923 two distinct foci were clearly recognisable in January 1924 :—(1) a southern epidemic area in the district of Rohtak, Karnal, Hissar and Gurgaon and (2) a large area in the sub-montane tract comprising the districts of Sialkot, Gujranwala, Lahore, Montgomery, Sheikhupura, Gujrat, Shahpur, Jhelum, Rawalpindi and Attock. In February the disease exhibited a similar distribution with the exception that the districts of Amritsar, Gurdaspur, Lyallpur and Jhang were now involved. The most conspicuous feature of the month however was the sudden rise in mortality from 4,364 deaths in January to 13,753 deaths in February. In March the plague mortality again underwent a marked rise, the recorded mortality being 50,395. The disease,

however, was still confined to the same area as before, but the districts of Jullundur, Ludhiana, Ferozepore and Multan were now slightly infected. Still maintaining the same distribution and the same relative intensity, the epidemic reached its acme in the month of April when no less than 86,469 deaths were recorded. The *diminuendo* of the epidemic was, contrary to custom, less abrupt than the *crescendo*, the plague deaths in May and June being 63,313 and 22,282 respectively, these figures being without precedent since the great epidemic of the year 1907. As already stated the slow decline of the epidemic was in large measure due to the abnormal weather prevailing during the months of April and May. The epidemic came to an abrupt end in July and in August six districts alone were infected. A further decline in mortality took place during the month of September, but the disease recrudesced in October. The mortality during the last three months of the year was however less than in the corresponding months of the previous year, it was most conspicuous in Multan City and in Gurgaon District, neither of which was severely involved during the spring.

Age, sex and class incidence.—The special liability of adolescents and young adults and more especially of women of child-bearing age to succumb to plague has already been referred to and it is here only necessary to remark that whilst amongst Hindus the increase of the female over the male death-rate in the year under review, as compared with the previous year, was 0·94 *per mille*, the corresponding figure in the case of Muhammadans was 2·86 *per mille*; the death-rate amongst Muhammadan women was thus raised out of all proportion to the female death-rate amongst Hindus.

Type of disease.—The disease in the vast majority of cases took the form of *bubonic* plague, but in almost every district an appreciable number of cases of septicæmic plague occurred. Some of these cases, as is customary during severe epidemics, exhibited no obvious sign of plague save the vesicular eruption to which the term "token" was given by the chroniclers of ancient epidemics. Primary pneumonic plague was also more in evidence than usual, this form of the disease being mainly confined to the districts in the extreme north of the Province. As usual, it was confined to the winter months (November to February) but further particulars regarding the epidemiology of the disease will be found in Appendix E.

Preventive measures.—During the early part of the year the efforts of the Public Health Department were directed towards limiting the spread of infection by carrying out intense rat destruction in and around infected villages, the disinfection of dwellings and the inoculation of persons exposed to infection. The sudden increase of the intensity of the epidemic in the month of February rendered it impossible to cope with all infected localities and from this time onwards attention was concentrated upon anti-plague inoculation, the evacuation of infected villages and the disinfection of infected houses. It soon, however, became evident that further measures were called for and it was decided at a conference called by the Hon'ble Minister of Education that a large increase in medical staff and medical supplies and equipment was necessary. Half-a-lakh of rupees was required to meet this expenditure and it is worthy of record that this sum was actually allotted on the day of the conference. Some 60 private medical practitioners were quickly engaged and the Inspector-General of Civil Hospitals directed Civil Surgeons to place every available medical officer upon plague duty. With these expanded resources a great effort, accompanied by intense propaganda and the frequent publication of press *communiqués* describing the actual situation and the means taken to cope with it, was made to control the epidemic. Mass inoculation was resorted to in many places and in certain districts complete evacuation of villages was carried out, whilst segregation camps and temporary plague hospitals were formed in several towns. These measures were continued until the sudden subsidence of the epidemic at the end of June allowed of their relaxation. It was however decided to retain the emergency staff until the end of the year (for which purpose Government gave another grant of Rs. 20,000) in order to enable an intensive rat destruction campaign to be carried out during the quiescent period. It was hoped that by this means to stamp out infection in those towns and villages where late or incomplete epidemics had occurred during the months of May and June and thus to limit

the recrudescence of the disease in the following spring. In accordance with this scheme the potential centres of infection were repeatedly "ratted" during the five months from July to November with the result that 6,406 villages were visited, 331,000 houses were trapped, 513,157 houses were baited and 113,941 houses were fumigated. Poisoned baits to the number of 7,258,996 were laid and 923,425 rats were reported to have been destroyed. It is difficult to assess the value of this campaign in terms of plague, but it is noteworthy that a majority of the villages thoroughly treated in this manner remained free from plague during the autumn whilst the disease recrudesced in many villages in which rat mortality (unfortunately not reported at the time) had occurred at the end of the previous epidemic.

Plague inoculation.—The number of anti-plague inoculations carried out during the year under review was 444,589 a figure which has only once been approached (in 1903) and even then it was less by 119,039 inoculations. This satisfactory state of affairs is due primarily to a marked change in the attitude of the people towards inoculation. Suspicion of this measure has now almost completely disappeared and in its place well-founded confidence in its great prophylactic value is almost universal. An attempt was made to estimate the precise degree of protection afforded by inoculation but, although many striking instances of its great value were forthcoming, the statistical data were not of a nature to permit of Major H. H. King, I. M. S., Central Research Institute, Kasauli (who kindly undertook the statistical analysis) to reach a more decided opinion than that the data afforded evidence highly suggestive of marked protection being conferred by inoculation. The second cause of the large increase in the number of inoculations was due to the extensive measures taken to bring inoculation within reach of all classes of the people. The unprecedented demand for vaccine—which was not altogether expected—was indeed responsible for a temporary check in inoculation due to difficulty in obtaining a sufficient supply of vaccine. Steps have been taken to rectify this state of affairs and arrangements have now been made to ensure that a reserve stock sufficient to meet all probable requirements shall in future be always available. The number of inoculations performed in each district necessarily depended largely upon the local intensity of the epidemic. The largest number of inoculations was performed in Rohtak District, (62,455); Lahore District including Lahore city (55,407) coming next, closely followed by Sialkot, (53,355); Lyallpur, (38,152); Gurgaon, (37,807); Amritsar, (30,491); Gujranwala, 22,475); and Gujrat, (22,38.). In one heavily infected district alone (Sheikhupura) was inoculation not widely resorted to by the people.

The largest number of inoculations performed by an individual officer was 15,622 which number stands to the credit of Dr. Thakor, District Medical Officer of Health, Gurgaon; Dr. Rasul, District Medical Officer of Health, Rohtak, performed 13,875 inoculations whilst Dr. Abdul Hamid, District Health Officer, Sialkot and Gujranwala, inoculated 13,032 persons.

The great value of evacuation was demonstrated more especially in the district of Jhang where many villages were completely evacuated immediately rat mortality commenced, with the result that in many cases, in spite of an intense rat epizootic, not a single case of plague occurred amongst the villagers. Evacuation was however usually carried out too late and even then not completely. In other cases the flight of the inhabitants was responsible for the spread of the disease to uninfected villages. Not much use was made of segregation camps and plague hospitals but the great camp erected in the Minto Park at Lahore showed that even in the case of large cities evacuation is not impossible.

The solution of the plague problem is still to seek. The advance in knowledge of the epidemiology of plague has not yet provided the practical sanitarian with effective weapons for fighting an epidemic under the difficult conditions prevailing in India. Reliance must still be placed upon intense *rat destruction* during the quiescent period in potential centres of plague, which unfortunately include most of the large towns, *inoculation* and *evacuation* during the plague season. The great importance of persistent effort during the non-epidemic season and the need of an adequate organisation to

supervise preventive measures, as well as to deal with emergencies, are therefore the chief lessons taught by this epidemic. In the Dutch East Indies the plague problem has been solved by re-housing the population, but clearly this method is not applicable in the Punjab; nevertheless, it is significant that no European and very few Indians living in houses designed on western lines contracted plague during this great epidemic. But if re-housing be not possible, it is clear that the plague problem would be vastly simplified, if, on the first appearance of rat mortality, infected dwellings were at once evacuated and their *inhabitants*, instead of fleeing to other localities, took up their residence in temporary quarters on the outskirts of their villages.

25. **Fevers.**—Under the generic head of "fevers", 452,187 deaths (22·04 *per mille*) were recorded during the year under report as compared with 420,398 (20·49 *per mille*) in the previous year and an average mortality of 377,338 (18·39 *per mille*) during the preceding five years. The districts exhibiting a "fever" death-rate above the provincial mean figure (22·04) were Dera Ghazi Khan, (37·16); Mianwali, (29·66); Karnal, (29·59); Muzaffargarh, (28·91); Multan, (25·25); Jhang, (25·01); Amritsar, (24·91); Hoshiarpur, (24·15); Hissar, (23·83); Attock, (23·74); Montgomery, (23·73); Gujranwala, (23·27) and Rohtak, (22·79).

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The "fever" death-rate of the 158 towns was 33,894 (16·34 *per mille*) as compared with 33,591 (16·20 *per mille*) during the previous year. The three cities of the Punjab Lahore, Amritsar and Multan—recorded "fever" death-rates of 19·03, 22·32 and 17·16 *per mille*, respectively, as compared with 17·29, 19·03 and 12·50 *per mille*, respectively, in the preceding year and an average "fever" death-rate of 15·24, 17·13 and 12·75 *per mille* during the preceding five years. In the towns with a population of over 10,000 the "fever" death-rate was in excess of the provincial rate in Kaithal, (30·37); Jagadhri, (27·29); Amritsar, (22·32), Baghbanpura Bhogiwal, (21·75); Karnal, (21·45); Fazilka, (20·75); Patti, (20·31); Khushab, (19·78); Batala, (19·10); Lahore, (19·03); Panipat, (18·87); Jalalpur, (18·72); Sirsa, (18·29); Sonepat, (18·26); Dera Ghazi Khan, (17·61); Multan, (17·16); Rohtak, (16·80) and Rawalpindi, (16·07). In certain of the smaller towns the "fever" death-rate was extraordinarily high: Dajal, (72·90); Begowala, (41·38); Karor, (40·97); Hafizabad, (37·65); Gohana, (37·40); Khudian, (34·39); Bhakkar, (32·29); Kaithal, (30·37); and Mukerian, (30·26).

The fever mortality includes the deaths from many febrile diseases, more especially malaria, plague, relapsing fever, influenza and even cholera, but it is possible to determine the cause of the relatively high "fever" death-rate in 1924 by noting its relationship to epidemic diseases exhibiting well-marked seasonal characteristics.

The "fever" mortality during the season of epidemic malaria (October November, December) was smaller by 21,204 in 1924 than in the corresponding months of the preceding year. It may therefore safely be assumed that the excess in the "fever" death-rate in 1924 over the figures for the previous year was not largely attributable to epidemic malaria. On the other hand a marked increase in the seasonal incidence of "fever" mortality took place in the district of Dera Ghazi Khan in association with an epidemic of relapsing fever and it is certain that the high "fever" death-rate in this district is attributable to this disease.

Finally, the "fever" death-rate was abnormally high during the spring in those districts in which plague was present in epidemic form and it is therefore probable that the high "fever" death-rate in the districts of Karnal, Rohtak, Gujranwala, Montgomery, Attock, Hissar and Jhang as well as in some of the towns in these districts, was due to bubonic, pneumonic and septicæmic plague.

26. **Influenza.**—No deaths from influenza were recorded during the year but 111 mild cases occurred during the month of February in one village of Kangra District and 85 cases were reported to have been treated in dispensaries in Muzaffargarh District.

27. **Relapsing Fever.**—The year under report was associated with a severe and widespread epidemic of relapsing fever in the district of Dera Ghazi Khan and a less severe outbreak in Muzaffargarh District. The disease was responsible for 17,373 cases and 1,611 deaths in the former district and 6,631 cases and 528 deaths in the latter district. Relapsing fever also appeared in the neighbouring district of Multan where 338 cases and 106 deaths were reported whilst a mild recrudescence of the disease (125 cases and 13 deaths) occurred in Ferozepore District. The total number of recorded cases and deaths during the year under report from this disease was 24,471 cases and 2,258 deaths as compared with 28,830 cases and 7,568 deaths in the previous year. The case mortality was 9 per cent. as compared with 26 per cent. during the previous year. The distribution of the disease in epidemic form corresponded closely with its distribution in 1923 but whereas last year the brunt of the epidemic fell upon Muzaffargarh District, in the year under report the District of Dera Ghazi Khan was mainly involved. As an account of the epidemiology of the disease is given in Appendix C, it is here only necessary to remark that during the year under report the disease attained its maximum severity somewhat earlier than usual, *viz.*, in May; that it rapidly declined during June and completely disappeared in July, since which month, except for a few cases in Muzaffargarh District in November and December, no further outbreak has occurred in any part of the Province.

As the result of experience gained during the past few years no delay anywhere occurred in detecting the nature of the disease and in organising preventive measures. In Dera Ghazi Khan District the recurrence of relapsing fever in epidemic form was anticipated and the Civil Surgeon (Captain S. N. Hayes, I.M.S.), with the active help of W. R. Wilson, Esquire, I.C.S., Chairman of the District Board, made elaborate preparations during the previous autumn to combat the threatened epidemic. All Medical Officers in charge of dispensaries were trained and equipped to diagnose the disease by the microscope; they were taught the technique of administering arsenical compounds by the intravenous route, and they were required to be on the alert to detect the first appearance of the disease. As a result of these measures the appearance of the disease in epidemic form was promptly reported and no time was lost in obtaining additional medical staff for duty at the dispensaries and for despatch to outlying areas. At the same time disinfecting gangs (previously trained at headquarters) were sent to infected villages to carry out "disinfestation." It is satisfactory to be able to record that these measures were attended with considerable success. During the year nearly 20,000 injections of neo-salvarsan were given and it speaks highly for the popularity of this mode of treatment that the total cost of the drug (Rs. 10,326) was recovered from the people without the least difficulty. It cannot be doubted that the energy and resource with which this campaign was carried out was in large measure responsible for the low death-rate.

The preventive aspect of the campaign presented greater difficulties since, in practice, it was found impossible to carry out the procedure of "disinfestation" with absolute completeness. Nevertheless the clothing of some 80,000 people was disinfected (by means of the *ghurrah* method devised by Captain Hayes) and over 80,000 blankets (*razais*) were ironed. The vigour with which this campaign was waged by Dr. Wazir Singh, District Health Officer, who also conducted the intensive propaganda by means of magic lantern lectures and distributed pamphlets throughout the district, combined with the curative treatment, did much to mitigate the effect of one of the worst epidemics of relapsing fever that has occurred in the Punjab during modern times.

In Muzaffargarh District, Dr. Wazir Singh, District Health Officer, with the active co-operation and assistance of Khan Bahadur Sheikh Saraj-ud-Din, Chairman of the District Board and the Civil Surgeon, carried out a similar scheme with the result that 3,605 persons were treated with neo-salvarsan and the clothing of 44,467 people was disinfected and 14,808 blankets were ironed.

28. **Malaria**—Malaria in the Punjab is so intimately associated with rainfall that the motto of the Punjab—*Crescate fluviis*—is almost equally

applicable to the great outbreaks of malaria that constitute the most striking feature of its epidemiology in this Province. No widespread epidemic however occurred during the year under review although epidemic conditions of moderate intensity prevailed during the autumn (more especially in the month of November) in the districts of Muzaffargarh, Sialkot, Gujrat, Lahore, Amritsar and Gurdaspur, together with smaller epidemic foci in a few other districts.

The incidence of autumnal malaria was thus in close accord with the final malaria forecast (issued on September 15th) which stated that :—

(*a*) There is no reason to apprehend the occurrence of a severe and widespread epidemic of malaria in the Punjab during the ensuing autumn ;

(*b*) malaria is likely to assume epidemic proportions in parts of Lahore, Amritsar and Gurdaspur;

(*c*) an epidemic of malaria is expected to occur in Muzaffargarh District;

(*d*) small epidemic foci are expected to occur in parts of Lyallpur, Montgomery, Sialkot, Jhelum and Gujrat Districts.

The epidemic in Muzaffargarh District, which followed upon severe flooding in July and August, though widely diffused was of moderate intensity. As the result of timely action upon the part of the District Health Officer, in collaboration with the civil authorities and the District Board, the outbreak of the epidemic in October found the district well supplied with quinine and with additional medical staff to afford medical relief.

A volunteer organisation containing representatives of the Education Department, the Punjab Red Cross Society and the Boy Scouts was also formed and they afforded much assistance in the distribution of quinine in the affected tract. Nearly 10 lbs. of quinine (172,250 tablets) were distributed, the cost of the drug (Rs. 5,186) being met partly by the District Board, partly by a grant from Government and partly from the Flood Relief Fund.

The 21st and 22nd provincial spleen census of school children was carried out in June and November, 1924. In the latter month 64,587 children under ten years of age belonging to 625 schools situated in all parts of the Province were examined with the result that the provincial spleen-rate was found to be 15·08 per cent. as compared with 11·83 per cent. in June 1924. In 71 schools the spleen-rate was *nil*, in 284 schools it varied between 0 and 10 per cent. in 103 between 10 and 20 per cent, in 82 schools between 20 and 30 per cent., in 51 between 30 and 40 per cent., in 41 between 50 and 60 per cent., in 12 between 60 and 70 per cent., in 11 between 70 and 80 per cent., in 12 between 80 and 90, and in 4 between 90 and 100 per cent.

This state of affairs, which represents approximately constant conditions cannot but fail to exercise a prejudicial effect upon the physical and mental development of the rising generation, and it is therefore satisfactory to be able to record that the scheme drawn up in 1921 for the medical inspection and medical treatment of school children has recently been revived and it is now under the consideration of Government.

A memorandum in regard to the influence of rice cultivation on malaria is given in Appendix D.

29. **Dysentery and Diarrhœa.**—The total number of deaths from dysentery and diarrhœa during the year under report was 11,817 or 0·58 *per mille* which is 0·01 in excess of the rate of the previous year and 0·11 higher than the average death-rate during the last five years. The provincial rate was exceeded in the districts of Kangra, (3·40) ; Gurdaspur, (1·21) ; Simla, (1·07) ; Rawalpindi, (1·00) ; Amritsar, (0·99) ; Lahore, (0·81) ; Sialkot, (0·77) and Gujranwala, (0·66). The most conspicuous increase in the death-rate over the mean of the previous five years occurred in Kangra District, the actual for the year 1924 being 1·38 in excess of the quinquennial mean figure. The urban death-rate was as usual higher than the rural death-rate, the former being 1·51 and the latter 0·47 as compared with 1·44 and 0·47 in the previous year.

Annual Form No. X.

It is impossible to state precisely the nature of the diseases recorded under the head of dysentery and diarrhœa, but it is known that enteric fever was widely prevalent in Kangra District and in certain of the large towns, more especially in Lahore. In Simla where the notification of infectious diseases is reasonably complete twelve cases (four Europeans and eight Indians) of enteric fever were reported, but in the case of the other municipal towns the true incidence of enteric fever and other infectious diseases will not become known until the notification of these diseases becomes a practice more honoured in the observance than in the breach.

30. **Respiratory diseases** —The disease of the respiratory system accounted for 54,483 deaths or 2·66 *per mille*, which constitutes an increase of 0·79 and 0·47 as compared with the death-rate of the previous year and the mean death-rate during the preceding five years. The provincial rate (2·66) was exceeded in seven districts, the excess being most marked in Ambala where the rate was 13·20 *per mille*, followed by Gurdaspur, (10·62); Kangra, (4·69); Amritsar, (4·34); Rawalpindi, (4·04); Lahore, (3·50); and Jhelum, (2·86). The high rate in Ambala and Gurdaspur districts possesses no significance since it is customary in these districts for many deaths due to "fevers" to be classified under this head, but in other districts exhibiting a high death-rate there is little doubt that many cases of pneumonic and septicæmic plague were recorded under the head of respiratory diseases. The urban death-rate (5·85) was as usual higher than the rural rate (2·30)—these figures being somewhat higher than the corresponding rates in the previous year, when they were 4·49 and 1·58 *per mille*, respectively.

Annual Form No. XI.

The respiratory disease death-rate in Lahore city was 8·96 and in Amritsar city, 11·42; it was also extremely high in the towns of Gujranwala (10·53); Ludhiana, 9·00); Jhelum, (8·67); Rawalpindi, (8·51); Multan, (6·72) and in Jullundur, (6·70). These figures constitute, with a few exceptions, the highest death-rates returned by any of the 158 Municipal towns.

31. **Pulmonary Tuberculosis.**—The high respiratory disease death-rate in urban areas is probably attributable in large part to pulmonary tuberculosis, but although the notification of this disease is compulsory under section 141 of the Punjab Municipal Act no reliable statistics of its incidence are available. The figures given in Appendix G do not therefore accurately reflect the true prevalence of the disease in the eight towns from which alone returns are available and it is at present only possible to state that the disease constitutes a serious plague in the cities and large towns (where sunlight and fresh air rarely if ever penetrate) whilst so far as is known, it is a relatively rare disease in rural areas.

32. **Diphtheria.**—Either as the result of increased alertness on the part of Medical Officers or to a definite increase in prevalence, diphtheria was reported from numerous localities during the summer and early autumn. An outbreak attended by 45 cases and 14 deaths occurred in Ludhiana town but unfortunately the nature of the disease was not at first recognised and it was not until its existence was established by the Civil Surgeon and by the Medical Officer of Health that steps could be taken to deal with it. Three cases of diphtheria occurred in Ambala City and four cases in Simla (two Europeans and two Indians). In both these instances the patients recovered as the result of prompt diagnosis followed by prompt treatment with diphtheria anti-toxin.

33. **Injuries.**—During the year under report 6,498 deaths (0·32 *per mille*) occurred as the result of injuries as compared with 6,405 (0·31 *per mille*) in the previous year and an average death-rate of 0·32 during the preceding five years. The deaths were classified as follows :—

Accidents, (4,598); wounds, (700); snake-bite, (687); suicide, (263); rabies, (135); injuries inflicted by wild beasts, (115).

The above figures exhibit remarkably little variation from year to year but the deaths attributable to snake-bite show an increase of 50 and those due to rabies of 43 over the figures for the preceding year.

34. **All other Causes.**—The total number of deaths registered under this head numbered 107,384 (57,272 males and 50,112 females). This figure represents a death-rate of 5·23 *per mille* which is 0·07 *per mille* in excess of that of the previous year and 0·60 in excess of the quinquennial average.

The highest death-rates were recorded in the districts of Gurgaon, (9·3) ; Ludhiana, (8·4) ; Kangra, (8·0) ; Jhang, (7·1) ; Lahore, (6·3) and Ferozepore, (6·1).

35. **Rabies.**—The number of persons from the Punjab treated at the Pasteur Institute, Kasauli, continues to increase, the figures for the past three years being 1,939 in 1922, 2,250 in 1923 and 2,786 in the year under report. Of the latter 444 were Europeans and 2,342 Indians. Five deaths occurred amongst patients under treatment, four Indians and one European, three being regarded as "failures" whilst in two the treatment was commenced too late.

Anti-rabic treatment is now available at the King Edward Medical College, Lahore, throughout the year, a circumstance which will probably increase the number of persons presenting themselves for treatment and lead to a reduction in the number of deaths from hydrophobia.

SECTION IX.—Public Health Works.

Urban and rural sanitation.

36. The year under report was rendered noteworthy by reason of the unusual interest displayed not only in the Legislative Council but also by members of District Boards and Municipal Committees in matters pertaining to the public health. It is clear that a widespread demand for sanitary reform has arisen and it is therefore peculiarly opportune, more especially as a certain rivalry has arisen between the protagonists of urban and rural sanitation, to detail the principles which would appear to govern the expenditure of public funds—necessarily limited in amount—upon measures designed to promote the public health. The first point it is necessay to emphasise is the fact that the problems presented by urban and rural sanitation are dissimilar. The broad facts in regard to mortality statistics of towns and rural areas are displayed in Table III, where the average annual death-rate *per mille* under each of the main heads of mortality during the period from 1871—1921 is given.

TABLE III.

Death-rate.	Towns.	Rural Areas.	Excess in towns.
Cholera	0·56	0·30	+0·26
Smallpox	0·94	0·61	+0·33
Plague	4·73	6·53	−1·80
"Fevers"	20·69	22·88	−2·19
Bowel complaints	2·51	0·66	+1·85
Respiratory diseases	5·77	2·32	+3·45
Injuries	0·40	0·35	+0·05
Other causes	11·26	6·80	+4·46
Total ...	41·58	36·04	+5·54

A scrutiny of this table shows not only that the towns are considerably more unhealthy than the rural areas—the average annual death-rate of the former being 5·54 in excess of the latter—but also that the urban death-rate exceeds the rural death-rate under every head of mortality save plague and "fevers." Further analysis of these statistics shows that there is a difference in the *quality* as well as the *quantity* of the deaths prevailing in towns and rural areas respectively. Under the composite head of "fevers", for example, the high "fever" death-rate in cities and large towns is mainly ascribable to diseases of the respiratory tract, more especially to tuberculosis, whilst in rural areas, where tuberculosis is relatively rare, the high "fever" death-rate is largely

due to epidemics of malaria. The causes of the high mortality in urban areas, in addition to diseases of the respiratory tract, are diseases of the intestinal tract (dysentery, diarrhœa, enteric fever and cholera). The remarkably low death-rate from bowel complaints and respiratory diseases in rural areas is noteworthy in view of the hackneyed statement of Indian publicists that the Indian village is merely an insanitary hovel situated upon the top of a dung-hill. This statement must indeed be regarded as misleading since villages, thanks largely to the disinfecting properties of fresh air and sunshine, exhibit a relative freedom from the diseases essentially associated with an insanitary environment whilst in congested urban areas, where "natural" sanitation is impossible and where sun-light and fresh air are lacking, the conditions are created in which man readily falls a victim to respiratory and intestinal diseases. The public health problem in large cities is therefore mainly concerned with the provision of a pure and ample water-supply, efficient drainage, sound methods of conservancy and sewage disposal and last, but not least, the free exercise by Municipal Committees of the ample but little-used powers conferred upon them by the Punjab Municipal Act for the purpose of safeguarding the public health.

On the other hand the main problem in rural areas is concerned with the prevention and mitigation of epidemics of malaria, plague, smallpox and relapsing fever and with the improvement of the quality and quantity of the water supply.

The report of the Sanitary Engineer to Government, Punjab, contained in Appendix B of this report, shows that, in spite of financial stringency, much has been done to improve the sanitary condition of municipal towns during the year under report. Water supply projects, at a total estimated cost of Rs. 30,12,806 were under construction during the year in twelve municipal towns, whilst thirteen large drainage projects, at an estimated total cost of Rs. 15,73,131, were also in hand. These and other sanitary works carried out on behalf of Municipal Committees by the Sanitary Engineer will no doubt increase the amenities of life in municipal towns, but they will not necessarily add to their healthiness *unless these sanitary works after completion are efficiently worked and adequately maintained.* It must regretfully be admitted that these desiderata have not often been met in the past and it is therefore necessary to emphasise the fact that no substantial improvement in the public health in urban areas is possible unless Municipal Committees evince an enlightened interest in public health administration and accord full support to their Medical Officer of Health in all his lawful undertakings. In certain cities and towns sanitary problems have not received the attention they deserved during recent years, but there is reason to believe that in some towns a serious attempt is now being made not only to recover lost ground but also to make progress in the realms of sanitary reform.

Income and expenditure of Municipalities.

37. The total income of Municipal Committees in the province during the year 1923-24, excluding opening balances, was Rs. 1,24,33,590 as compared with Rs. 1,19,44,441 in the previous year, whilst the total expenditure upon public health and vaccination, excluding grants-in-aid, was Rs. 63, 70,988. In certain localities the expenditure upon public health measures has not however kept pace with the increase in population, in certain others it actually shows a decline as compared with ten years ago. It is therefore not surprising that suburbs of faulty design have been allowed to grow up without any provision for drainage and sanitation and without regard to the future expansion of the town. There were 1,413·73 acres of land under irrigation by sullage in the principal towns of the province, which represents an increase of 117·81 acres under irrigation as compared with the previous year. The income derived from this source was Rs. 83,270 which shows a decrease of Rs. 7,139 as compared with the previous year. There can be little doubt that with efficient administration the sewage farms of many municipal towns could be made to yield a larger income than is at present obtained from this source.

38. Much criticism has been directed towards the Sanitary Board in regard to the relatively small assistance given by it for the improvement of the health of the rural population, but it is clear that the execution of

water supply and drainage projects in small villages is not a sound proposition from the economic point of view nor, for reasons already given, can these measures be regarded as matters of urgent importance from the point of view of the public health. Here land drainage schemes designed to prevent floods, which are in a large measure responsible for the outbreak of epidemics of malaria, are peculiarly calculated to benefit the rural population.

During the year under report the Drainage Board, although it was handicapped (in common with other departments) by lack of funds, has had under consideration and, in some cases, under construction, important schemes for improving the natural drainage channels in the districts of Gurgaon, Karnal, Amritsar, Hoshiarpur and Sialkot whilst the adoption of measures to mitigate water-logging in certain other tracts has also engaged its attention.

The Sanitary Engineer was also engaged in carrying out a scheme for improving the water-supply of rural areas in Gurgaon District at an estimated cost of Rs. 55,622 whilst fourteen trial borings either in connection with the water-supply schemes or to increase the water-supply in rural tracts were made. There is however little sign of enthusiasm on the part of District Boards and villagers in public health matters and the Sanitary Board has found great difficulty in inducing District Boards to submit schemes for improving the sanitary condition of rural areas. No reward was given by a District Board to any village for improving its sanitary condition. The number of wells cleaned and parapets constructed during the year, at a total cost of Rs. 22,662, was 10,744 and 177, respectively as compared with 7,398 and 364 in the previous year. The sanitary rules framed by the District Board and sanctioned by the Government were enforced in one village in Rohtak District, but the sanitary committees of other villages where these rules were applied in preceding years showed little enthusiasm in carrying them out. In eight villages in Karnal District the village sanitation scheme worked satisfactorily and some small drains were constructed in a few villages of Jullundur District. Some streets in a village in Amritsar District were paved at a cost of Rs. 1,324 whilst thirteen villages in Gurdaspur District maintained a regular conservancy establishment. In Shahpur District the sanitary arrangements at Fariqpur village continued to work satisfactorily, but in Jawairain difficulty arose owing to delay in paying the wages of the conservancy staff. It is clear that no rapid improvement in the sanitation of Punjab villages can be expected and it must be recognised that it would serve no useful purpose to endeavour, in advance of public opinion, to dragoon the zamindar over his dung-hills.

Works of public utility by private individuals.

39. A list of works of public utility constructed during the year 1923-24 by private individuals at their own expense is given below :—

Ambala Division—Rohtak District.—A well and a dharamsala at Ismailpur at a cost of Rs. 600 by Udmi, son of Sajan of Badli. A well at Gohana at a cost of Rs. 500 by Sheoji, son of Hari Ram, Mahajan, of Badli. A well and a dharamsala at Sonepat at a cost of Rs. 2,500 by Mussammat Manbhari, widow of Devi Sahai, Bhat, of Sonepat.

Gurgaon District.—A dharamsala and a well on Bhondsi Ghairatpore Bees Road at a cost of Rs. 4,000 by Bhagwana, son of Ganeshi, Mahajan, of Bhondsi. A well with tank at Tikli at a cost of Rs 1,200 by Mussammat Anandi, widow of Nand Lal Ahir of Tikli. A dharamsala with well on the road of Chhaoni Gurgaon at a cost of Rs. 1,500 by Baba Narsingh Das, *alias* Rishi Ji of Mohammadpore Jharsa. A well with Khel Kotha at Zainabad at a cost of Rs. 4,000 by Bhairon Parshad, son of Ram Gopol, Mahajan, of Dahina. A well and Piao on Palwal-Sohana Road at a cost of Rs. 1,500 by Roshan, son of Harpool, Mahajan, of Hajipore. A dharamsala and a well on Palwal-Sohna Road at a cost of Rs. 1,500 by Kalwa, son of Baldeo, Jat, of Hajipore. A dharamsala with a well at Garhi Harsaru Railway Station at a cost of Rs. 15,000 by Kishan Lall, son of Harnam Dass, Mahajan, of Garhi Harsaru. A dharamsala and well at Farrukhnagar-Sohna Road at a cost of Rs. 40,000 by Ram Gopal, son of Gulab Rai, Mahajan, of Bhangrola. A dharamsala with a well and Khel Kotha and Piao at Rewari at a cost of Rs. 16,000 by M. Chhitar Mal, son of Nathu Ram Bhargava, of Rewari. A road between Khol and Kund at a cost of Rs. 800 by Lakhpat Ram, Brahman of Khol.

Karnal District.—A pacca well on Kaithal-Pehowa Road at a cost of Rs. 800 by Paras Ram, son of Radhe Lal, Mahajan of Keorak.

Jullundur Division—Kangra District.—A pucca well in Tikka Tainkhani Tappa Ugyalta at a cost of Rs. 4,000 by L. Shiba, son of Fattu, caste Khatri, of Tikkan Khatrian Tappa Bamsam, Hamirpur tahsil. A pucca spring (baoli) in village Rangan at a cost of Rs. 600 by Mian Mali Ram, Jamadar, caste Rajput, of village Rangan, Hamirpur tahsil. A pucca baoli in Garli village at a cost of Rs. 500 by Pandit Kirpa, son of Sapuran, Brahman, of Garli, Dehra Tahsil. A pucca baoli in Mauza Chamyana, at a cost of Rs. 300 by Mian Jodh Singh pensioned Subedar of Chhal Tappa Chamyana, Hamirpur tahsil. A pucca stairs on a path to Ichhra Kund at Bhown, Kangra tahsil, at a cost of Rs. 6,000 by Seth Tula Ram-Gauri Shanker of Khanja, district Baland Sher in the United Provinces.

Hoshiarpur District.—A pucca tank on Gagret-Chintpurni road at a cost of Rs. 1,000 by Mahant Atma Nand, Chela Mahant Parmanand Brahmcharia, Manager of the Thakur dawara of Bawa Ludras, village Nari, tahsil Una. A pucca well in village Khawaspur at a cost of Rs. 900 by Chhajju, son of Kadu, Jat, of Khawaspur, tahsil Hoshiarpur. A pucca well with a katcha shed on Ispur-Gagret road at a cost of Rs. 800 by Mast Ram, son of Sodagar, Brahman, of Kothera Jaswalan, tahsil Una. A pucca well with a pucca shed on the pathway leading from Hoshiarpur to Khanpur at a cost of Rs. 700 by Mussammat Karam Devi, widow of Maghi Ram, Bania, of Khanpur, tahsil Hoshiarpur.

Jullundur District.—A well in village Buttran at a cost of Rs. 200 by Mussammat Jawali, widow of Gulab Singh, caste *Jat*, of village Buttaran, tahsil Jullundur. A well in village Pharala at a cost of Rs. 600 by Narindar Singh, son of Charat Singh, Jat, of Pharala, tahsil Nawanshahr, now Wasil Baqi Nawis, Phillaur. A well along with a house intended for public use in village Bara Pind at a cost of Rs. 1,000 by Jagat Singh, Blacksmith, of village Bara Pind. A serai in Nawanshahr at a cost of Rs. 20,000 by L. Durga Das, Khatri, of Nawanshahr, L. Bant Ram, Khatri, of Nawanshahr and L. Ram Saran, Khatri, of Nawanshahr.

Ludhiana District.—One pucca well at Seh, tahsil Samrala, on the borders of Seh Gagra and Manki villages at a cost of Rs. 600 by Kallu, Khatri, of Seh, tahsil Samrala. One pucca well with a kotha at Lohar Mazra, tahsil Samrala, at a cost of Rs. 900 by Bhan Singh, Jat, of Dadhari, tahsil Samrala. One pucca well at Goslan at a cost of Rs. 600 by Rollu carpenter, of Goslan, tahsil Samrala.

Ferozepore District.—A pucca well at village Thandewala, tahsil Muktsar, at a cost of Rs. 1,300 by certain inhabitants of village Thandewala, tahsil Muktsar.

Lahore Division.—Lahore District.—A well for drinking purposes on Chunian and Kangarpur Road at a cost of Rs. 175 by Haji Abdulla, son of Abdul Rahman, caste Khoja, of Shamkot Nau.

Gurdaspur District.—A drinking well in the village Chatri, tahsil Shakargarh, at a cost of Rs. 880 by Mussammat Jamna Devi and Banka, caste Rajput, of Chatri, tahsil Shakargarh. A serai with shops in the village Chak Hasan, tahsil Pathankot, used by all sections of the public at a cost of Rs. 60,000 by Nihal Shah, son of Saudagar, Arora, of Chak Hasan. A drinking well in the village Jiani Dakhli Theryal at a cost of Rs. 15,000 by Sultan Singh and Company, Simla.

Rawalpindi Division.—Attock District.—A serai near Basal Railway Junction at a cost of Rs. 16,000 by Mussammat Bishan Devi, widow of Narayan Dass, of Thatha, tahsil Pindigheb.

Mianwali District.—A well known as Hathi Khan wala, dakhli Sultan wala sharqi, at a cost of Rs. 7,000 by M. Hathi Khan, son of Gul Khan, Pathan of Chak Hathi Khan-wala sharqi.

Multan Division.—Montgomery District.—A pucca well for public benefit in Ram Singh Street at a cost of Rs. 1,500 by Sardar Jhanda Singh of Montgomery. A pucca well for public benefit in Ram Singh Street at a cost of Rs. 1,500 by Lala Uttam Chand of Montgomery. A pucca well for public benefit in Dipalpur bazar at a cost of Rs. 1,500 by Lala Mohri Ram of Montgomery. A pucca well for public benefit in Dilpalpur bazar at a cost of Rs. 1,500 by Lala Jhangi Ram of Montgomery. A pucca well for public benefit in Sayyid Muhammad Street at a cost of Rs. 15,000 by Mian Muhammad Sharif of Montgomery.

Lyallpur District.—A well on the roadside at a cost of Rs. 600 by Sant Singh, son of Naurang Singh, of 68 Rakh Branch, Jarranwala. A well on the roadside at a cost of Rs. 700 by Budha, son of Uumra, of 102 Rakh Branch, Jaranwala. A well on the roadside at a cost of Rs. 700 by Gurdit Singh, son of Mian Singh, of 103 Rakh Branch, Jaranwala.

Jhang District.—A Charanjitwala well near Shadiwala on the road leading to Jhang at a cost of Rs. 1,200 by Lala Ram Kishen of Jhang City. A Gobind Dass wala well near Adhiwal on the road leading to Jhang at a cost of Rs. 1,200 by Lala Gobind Dass, caste Bhutiani, of Jhang City.

SECTION X.—Administration.

40. The re-organisation of the Public Health Department has not yet come into full operation, and from June 5th, 1924, when Lieutenant-Colonel W. H. C. Forster, D.P.H., I.M.S., Director of Public Health, Punjab, went on eighteen months' leave, the superior personnel which should comprise

one Director and four Assistant Directors was reduced to one Director and two Assistant Directors. It has consequently not yet been possible to locate a whole-time Assistant Director at Ambala and Rawalpindi, respectively. The Assistant Director of Public Health, Ambala Range, was appointed from the 1st July to act as Assistant Director of Public Health (Technical) Epidemiology and to hold charge of half the districts in Lahore Division in addition to his own duties, whilst the Assistant Director of Public Health (Technical) Vaccination held charge of the Rawalpindi Division and the remaining districts of the Lahore Division. This officer also acted as Lecturer on Hygiene in the King Edward Medical College, whilst he also lectured to the post-graduate class of Assistant Surgeons, and to the fifth year students in Vaccination. He likewise lectured on Hygiene to the Sanitary Inspectors' class.

Two new appointments of District Medical Officer of Health were created during the year, making a total of six, and two vacancies in the cadre of Assistant Epidemiologists (now termed District Health Officers) were filled during the year, making a total of eighteen District Health Officers (all possessing diplomas in Public Health) in charge of 29 districts. Sanction was accorded to the appointment of four more District Medical Officers of Health during the ensuing year and the time is therefore not far distant when every district will be in charge of a wholetime officer with expert knowledge of the science of preventive medicine. The number of Municipal Medical Officers of Health (eight) remained the same as last year. Ambala City was again excused on financial grounds from employing a Medical Officer of Health, but Ferozepore City has agreed to employ a Medical Officer of Health at the commencement of the next financial year.

Owing to the severe epidemic of plague the staff of the Department was increased as a temporary measure by ten Medical Graduates, thirteen Sanitary Inspectors, eleven dispensers, twenty-two clerks and twelve peons. This additional staff, which did excellent work during the plague epidemic, was retained after its conclusion in order to carry out an intense rat destruction campaign during the autumn.

Some progress was, therefore, made in giving effect to the re-organisation scheme, but before the Public Health Department can function with complete success several important questions, which are now under the consideration of Government require to be settled.

Inspections.

41. The duties of the Director of Public Health as a member of the Legislative Council, Secretary of the Sanitary Board and member of other Boards and Committees limited the time at his disposal for carrying out formal sanitary inspections. During the year under report the Municipal towns of Hazro, Simla, Rohtak, Rewari, Gurgaon, Pathankot and Dharmsala were, however, inspected. The annual inspection of the King Edward Sanatorium, Dharmpore, was also carried out and the emergency measures taken in the flooded area in Karnal, Rohtak and Gurgaon Districts were also inspected. Finally, the health conditions and, more especially the water supply, of Kangra district was the subject of a local investigation conducted in the month of December.

The Assistant Directors of Public Health were constantly on tour supervising the work of District Health Officers in connection with anti-plague, anti-cholera measures, vaccination inspections and the registration of births and deaths. The Assistant Director of Public Health (Technical) Epidemiology, Punjab, also inspected the Public Health Equipment Depôt at Jullundur and the Assistant Director of Public Health (Technical) Vaccination, Punjab, made repeated visits to Multan in connection with the plague epidemic in that city and he also supervised the arrangements made in the flooded area of Muzaffargarh District to prevent the outbreak of epidemics.

District Medical Officers of Health and District Health Officers made sanitary inspections of 118 large towns and 5,797 smaller towns, whilst they were constantly on tour in rural areas in connection with the suppression of epidemics and in inspecting vaccination.

42. *Epidemiological Bureau.*—The work of the Epidemiological Bureau suffered during the latter half of the year from the lack of a whole-time officer but field investigations were carried out in Dera Ghazi Khan and Muzaffargarh districts in connection with relapsing fever whilst the malaria surveys were conducted at Ludhiana, Qadian, Gurgaon, Hissar and Sulemanki. An enquiry was also made into an outbreak of dysentery in the neighbourhood of Kotgarh in Simla Hill States. An investigation was also carried out in collaboration with Dr. C. D. Tiwari, D. P. H., Medical Officer of Health, Jullundur, to determine the value of cresol fumigation in the destruction of fleas in *kutcha* and *pucca* houses. The efficacy of sulphur fumigation (by means of Lane's *neem battis*) in destroying rats and rat-fleas in Indian villages was also tested.

As regards laboratory investigations, the study of the precise part played by cattle in protecting man from the bites of mosquitoes, which was started last year, was completed and the result will shortly be summarised in a scientific memoir.

The study of the epidemiology of malaria was also continued and the power of certain species of mosquitoes to transmit malaria was tested.

The fourth malaria forecast was prepared and the 21st and 22nd Provincial spleen census of school children, to which reference has already been made, was carried out by the Bureau. Routine work comprised the examination of a large amount of pathological material submitted by District Health Officers.

During the course of the year the Bureau was equipped to carry out the bacteriological analysis of water and towards the end of the year work in connection with testing the bacteriological purity of municipal water-supplies was commenced.

43. *Education Bureau.*—Great progress was made in spreading knowledge in regard to the cause, nature and mode of prevention of disease by means of lantern lectures, posters and pamphlets and during the latter half of the year District Medical Officers of Health and District Health Officers delivered over 4,000 lectures mainly to school children in urban and rural areas. In this connection the thanks of the Department are due to the Punjab Red Cross Society who not only supplied 31 magic lanterns but paid for the preparation by the photographer attached to the Bureau of 4,411 slides dealing with plague, malaria, relapsing fever, child-welfare, ante-natal hygiene and reproduction.

The Bureau also prepared sets of slides for the Registrar, Co-operative Credit Society, the Sanitary Engineer to Government, Punjab, the Warden of Fisheries, the Punjab Health Week Committee and for the Central Branch of the Lady Chelmsford League.

44. *Fairs.*—All important fairs and religious gatherings held in the Province during the year were attended by District Health Officers and in some cases by the Assistant Directors of Public Health. It is satisfactory to be able to record that as the result of the arrangements made to safeguard the health of the pilgrims no outbreak of cholera or of any other disease occurred at any fair during the year.

45. **Acknowledgments.**—As the result of the emergencies created by the great epidemic of plague and by relapsing fever during the spring and early summer, by cholera during the monsoon period and by floods during the autumn, the work thrown upon the Public Health Department during the year was exceptionally onerous. And since the efforts made to meet these emergencies usually befitted the occasion, it is difficult to single out names for special mention; nevertheless it would be inappropriate to conclude this section of the report without making some acknowledgment of the good work done during the year. The duty of promoting the public health brings the officers of the Department into close touch with those of other services and departments and it is a matter of gratification to be able to state that the co-operation already existing between the public health and other departments has been confirmed and extended during the year under report. In the case

of the Education Department, with which the relations of the Public Health Department are necessarily intimate, the complete nature of the co-operation was particularly well exemplified in the valuable assistance afforded to the Public Health Department during the epidemic of plague by R. Sanderson, Esquire, I. E. S., Divisional Inspector of Schools, Lahore Division. Great help was also given during this epidemic by the Deputy Commissioners of the infected districts, whilst a special word of thanks is due to W. R. Wilson, Esquire, I. C. S., Deputy Commissioner, Dera Ghazi Khan, for his assistance during the epidemic of relapsing fever in that district. Cordial relations have also been established with the Medical Department and acknowledgments are due to Col. C. R. Bakhle, I. M. S., and to many Civil Surgeons—in particular to Capt. S. N. Hayes, I. M. S., Civil Surgeon, Dera Ghazi Khan—for the ungrudging manner in which all requests for assistance were invariably met. Amongst Medical Officers of the Public Health Department special mention must be made of the excellent work of Khan Bahadur Dr. Abdur Rahman, whose unfailing energy and initiative at times of emergencies, as well as in the performance of his multifarious duties, was invaluable. Amongst Medical Officers of Health the keenness and energy displayed by Major J. R. D. Webb, O. B. E., I. M. S., Medical Officer of Health, Simla, stood out prominently whilst the work performed by Dr. A. B. Arora, Medical Officer of Health, Lahore, during the plague epidemic in Lahore City demands recognition. Dr. G. R. Vohra displayed considerable energy and ability in organising and carrying out public health measures in Kangra District. Mention must also be made to Dr. R. B. Lal in whom a distinct *flair* for scientific research is associated with enthusiasm in its prosecution. The work performed by Dr. M. J. Thakor, District Medical Officer of Health, Gurgaon, in carrying out anti-plague inoculation and the energy displayed by Dr. S. G. Rasul, District Medical Officer of Health, Rohtak, during a prolonged and severe epidemic of plague also call for mention. The same remark applies to Dr. Abdul Hamid, District Medical Officer, Sialkot and Gujranwala; to Dr. Harnath Singh, District Medical Officer of Health, Karnal; to Dr. Jaimal Singh, District Medical Officer of Health, Amritsar, all of whom have received promotion as a reward for their good work. Amongst recent recruits to the Department the keenness and energy displayed by Dr. Wazir Singh, District Health Officer, Dera Ghazi Khan and Muzaffargarh; Dr. Chaudhri, District Health Officer, Multan and Montgomery and Dr. Narinjan Singh Sethi, District Health Officer, Gujrat and Jhelum are full of promise.

Finally acknowledgments are due to Mr. Jennings, Superintendent and to the clerical establishment of the office of the Director of Public Health for the manner in which they responded to the heavy calls made upon them both in connection with the normal work of the department and extraneous duties in connection with the celebration of Punjab Health Week.

46. **Conclusion.**—In concluding the report it is necessary to make regarding the state of the public health in the Punjab during the year 1924 (in which an attempt has been made to interpret, so far as may be, the significance of the statistical data contained therein) it is appropriate to point the moral by a quotation from the Annual Report for the year 1923 of the Chief Medical Officer of the Ministry of Health, Sir George Newman, who thus summarises the relationship of preventive medicine to the body politic :—

> Public Health is purchasable, but only in the long run, and only on a true understanding of scientific facts. Merely to send post-haste a Medical Inspector to visit on a preventive mission an area suffering from an acute and exceptional prevalence of disease is to shut the stable door when the horse has escaped, or attempt to assuage or avoid the attacks of disease by a bottle of medicine. It is neither State-craft nor science. What is needed for the health of a community is that which is needed for the health of an individual, a wholesome and resistent constitution—to be prepared, ready, forearmed. In public health work this means *sanitation*, nutrition, the establishment of immunity, and what Sir John Simon called 'the necessaries of health.' Now, the advance of preventive medicine has in recent years been so rapid, and Pelion has been piled upon Ossa so expeditiously in the attempt to reach Olympus speedily, that it has been found necessary to attend to the immediate demands of the present rather than the sounder process of true prevention. The best practice of all would, of course, be the balanced combination, namely the maintenance of preparation and the prompt attack. But it must be said quite plainly that the prompt attack has become so insistent, centrally and locally, that its tendency has been to absorb attention. Here, alas, is an epidemic, surely come upon us unjustly and surreptitiously, like a thief in the night! Let us chlorinate the

water, disinfect the drains, boil the milk, provide a temporary hospital, or get vaccinated. These are, in all probability, the right and proper things to do under the circumstances, but it would be wiser to be fore-armed, and to have a wholesome water-supply, effective drainage, clean milk, an available hospital and a prepared immunity. When the fire occurs, it is too late to purchase a fire-engine or take out an insurance. The experience of each year confirms the view that, both centrally and locally, we cannot afford to neglect the steady application of the bed-rock principles of sanitation.

The peculiar applicability of these remarks to the public health problem in the Punjab scarcely needs emphasis. The importance of preparedness has indeed been indicated in the sections of this report dealing with plague, relapsing fever and cholera. It was likewise emphasised in the Annual Vaccination Report for the year 1923-24 wherein it was stated that the true method of preventing the outbreak of smallpox was by *sustained effort* to increase the immunity of the population by vaccination rather than by a spasmodic effort after an epidemic has broken out. It would perhaps at present be an exaggeration to regard the outbreak of an epidemic as implying a failure on the part of the public health administration, but it is at any rate necessary to combat the idea that expenditure upon public health measures can properly be reduced to a minimum so long as no epidemic is present : those who hold this view are apt to ignore the existence of an epidemic so long as possible and to regard the hasty adoption of emergency measures as the sole mode of safeguarding the community against epidemic explosions. It is to be feared that the importance of preparedness is often overlooked and consequently the need for sustained effort during non-epidemic periods is not fully appreciated. It must be emphasised that emergency measures constitute the *second* and not the first line of defence, and that an attitude of preparedness, both centrally and locally, should be the watchword of public health administration. Compliance with this desideratum, however, demands the existence of enlightened public opinion, whole-hearted devotion to the public weal and, last but not least, an increased expenditure upon public health measures. The " necessaries of health " indeed demand a financial sacrifice of considerable magnitude, and it is for consideration, whether centrally and locally, all that is possible is being done in this direction. It would serve no useful purpose to state the number of dollars or the number of shillings per head of population now being spent upon public health measures in America and England, since the amount that it is proper to apply to the preservation of the public health must depend not only upon available resources, but also upon the amount that can be usefully expended. In view, however, of the fact that the amount spent from provincial sources upon the education of *the rising generation* is 118·48 lakhs per annum as compared with 14·0 lakhs allotted for the purpose of safeguarding the health of *the whole population*, it is hoped, in view of the rapid advance of public opinion in regard to *sanitation*, that the Legislative Council and Local Bodies will recognise the vital need of according more generous recognition to the claims of public health.

It is, however, not by money alone that public health is purchasable. Single-minded devotion on the part of all those charged with the care of the public health is a deseratum of even greater importance. And it is on the measure of recognition accorded to this fact that the health and consequently the prosperity of this great province must be largely dependent. It indeed follows from the biological laws that determine " the survival of the fittest " that the future belongs to those who, in the widest sense of the term, are best adapted to their environment. It behoves therefore the *alumni* of our University, our virile military population, our merchant princes and last but not least the members of our Legislative Council to remember the words of the Greek philosopher and physician, uttered some 2,000 years ago, that " Science and Art have equally nothing to show, Strength is incapable of effort, Wealth useless and Eloquence powerless, if Health be wanting."

SIMLA :
June 18th, 1925.

C. A. GILL, LT.-COL., I.M.S.,
Offg. Director of Public Health, Punjab.

APPENDICES.

APPENDIX A.

PROCEEDINGS OF THE SANITARY BOARD, PUNJAB.

Meetings of the Sanitary Board took place in Lahore during the month of February, March, May, August and November 1924. The composition of the Board at the end of the year and the number of attendances of each member is shown below :—

Name and designation.	Nature of representative.	No. of attendances.
1. The Hon'ble Mian Sir Fazl-i-Husain, Kt., Minister of Education (President)	Official member	4
2. J. G. Beazley, Esq., I.C.S., Secretary to Government, Punjab, Transferred Departments	Ditto	4
3. Miles Irving, Esq., O.B.E, I.C.S., Secretary to Government, Punjab, Finance Department	Ditto	2
4. A. R. Astbury, Esq., M.I.C.E., Secretary to Government, Punjab, Public Works Department, Buildings and Roads Branch	Ditto	2
5. A. Langley, Esq., C.I.E., Commissioner, Lahore Division	Ditto	2
6. Colonel C. R. Bakhle, I.M.S., Inspector-General of Civil Hospitals, Punjab	Ditto	2
7. Rai Bahadur Lala Amar Nath, Nanda, Sanitary Engineer to Government, Punjab	Ditto	4
8. Lala Ganpat Rai, Bar.-at-Law	Rural representative.	4
9. Mir Ahmad Yar Khan, Daulatana, of Luddon ...	Ditto	4
10. Rao Pohap Singh, M.A., LL.B., M.L.C. ...	Ditto	4
11. Chaudhri Saidullah Khan, B.A., LL.B., M.L.C. ..	Ditto	3
12. Sir Sayad Mehdi Shah, K.C.I E., O.B.E., M.L.C. ...	Ditto	2
13. Sardar Randhir Singh, M.L.C.	Ditto	2
14. Sir Gopal Das, Bhandari, Kt., C.I.E., M.B.E. ..	Urban representative.	0
15. Lieutenant Colonel C. A. Gill, D.P.H., I.M.S., Offg. Director of Public Health, Punjab (Secretary) ...	Official Member	5

Certain changes in personnel took place during the year; Mr. Beazley succeeded Mr. Latifi in October 1924, and Lieutenant-Colonel Gill took the place of Lieutenant-Colonel Forster as Secretary in June. Mr. Astbury, on appointment as officiating Secretary to Government, Public Works Department, after eight years' service as Sanitary Engineer, was succeeded by Rai Bahadur Lala Amar Nath, Nanda. Mr. Astbury, however, continued to be a member of the Board as Secretary to Government in the Public Works Department and the Sanitary Board was therefore not deprived of his ripe knowledge and wide experience of sanitary problems in the Punjab. The number of meetings held by the Board during the year under review was somewhat less than usual owing to the fact that, as the result of heavy commitments in the past, the funds at the disposal of the Board were strictly limited and many sanitary projects had in consequence to be postponed. A thorough examination of the financial position of the Sanitary Board was

carried out du ring the year and the considered views of the Board were placed before Government in Septe mber 1924. It is hoped that following the removal of certain administrative difficulties, an d that with the larger funds recently placed at the disposal of the Board it will in future be po ssible to assist local bodies to accelerate the pace of sanitary reform in both rural and urba n areas. One important point brought to light during the course of the investigation of the financial position of the Board was the fact that, if sanitary schemes are to justify the expenditure of large sums of public money, it is imperative that their immediate and ultimate financial effect should l e clearly envisaged by local bodies before their inception, and that adequate provision should be made to meet maintenance and depreciation charges, together with interest on capital and loans.

The Auditor attached to the Sanitary Board audited the accounts of six aided schemes with the result that many irregularities in the maintenance of accounts were brought to light and unexpended balances amounting to Rs. 14,139-2-2 were discovered and credited to the Board.

The Chemist attached to the Sanitary Board was employed throughout the year in analysing cows' and buffaloes' milk and ghee with a view to the notification of standards of purity under the Punjab Adulteration of Foods Act. This work has now been completed, and it is hoped that legal standards will shortly be fixed by Government.

The grants sanctioned at the meetings of the Board held in February and March 1924 out of the budget provision for the the year 1923-24 were as follows :—

		Rs.
1.	Campbellpur water-supply extension scheme ...	93,892
2.	Additional stand-posts and pipe-lines at Sangla ...	2,883
3.	Intramural drainage and paving of streets, Eminabad Town.	13,932
4.	Multan water-supply scheme	64,550
5.	Lahore water-supply extension scheme ...	64,549
6.	Improvement of the rural water-supply of Gurgaon District	46,741
7.	Trial boring of well at Jahazgarh and Matan Hail village in Rohtak District	3,472
8.	Experimental meters at Sialkot	225
9.	The Lahore water-supply extension scheme ...	5,093
	TOTAL ...	2,95,337

A fresh grant of Rs. 4,40,800 was placed at the disposal of the Sanitary Board for allotment during the financial year 1924-25, and from this sum the following grants amounting to Rs. 3,65,158 were made up to 31st December 1924, leaving a balance of Rs. 73,642 to be distributed during the last three months of the financial year :—

		Rs.
1.	Guma project Simla water-supply extension scheme ...	76,698
2.	Sargodha water-supply extension scheme ...	91,351
3.	Improvement of the rural water-supply of the Gurgaon District	8,881
4.	Muktsar water-supply scheme	41,297
5.	Jullundur drainage scheme	68,986
6.	Rewari water-works	46,000
7.	Rewari water-works approach road	5,407
8.	Sillanwali water-supply scheme	5,000
9.	Equipping the Sarangpur pumping station with a second boiler and pump	8,410
10.	Laying a bye pass to join Sarangpur pumping main to the pumping main from Handesra to Ambala City...	1,539
11.	Laying a pipe-line from a spring in the Hills to the village Chhapri (in Mianwali District) ...	911
12.	Drainage and paying of streets of Ugoke village (Sialkot District)	1,000
13.	Khem Keran drainage scheme	1,772
14.	Jandiala drainage scheme	906
	TOTAL ...	3,65,158

APPENDIX B.

ANNUAL REPORT OF THE SANITARY ENGINEER TO GOVERNMENT, PUNJAB, FOR THE YEAR 1924.

(1) Administration.

Mr. A. R. Astbury, M.I.C.E., remained in charge of the post of Sanitary Engineer to Government, Punjab, up till 5th November 1924, when, on being promoted to the post of Chief Engineer and Secretary to Government, Punjab, Public Works Department, Buildings and Roads Branch, he was relieved by Rai Bahadur Amar Nath, Nanda, B.A., M.I.E. (Ind.), who held charge of the post for the remainder of the year.

Headquarters of the No. I Sanitary Provincial Division were transferred from Lahore to Rawalpindi with effect from 2nd January 1924.

In furtherance of the policy whereby the Sanitary Engineer undertakes the execution of sanitary scheme, a temporary Sanitary Division was constituted under charge of Mr. G. T. Pound, Executive Engineer with headquarters at Multan, with effect from 1st April 1924. In consequence of this Mr. J. E. Robinson, Upper Subordinate, was put in charge of the Multan Sanitary Sub-Division formerly held by Mr. G. T. Pound.

The services of Mr. A. E. Knox, Executive Engineer, were transferred to the Sanitary Circle for the preparation of a detailed project for Amritsar sewerage and drainage.

Certain major works in the No. III Sanitary Provincial Division having reached completion, and the officer in charge of it (Rai Bahadur Amar Nath, Nanda) having been appointed officiating Sanitary Engineer, this division was abolished with effect from the 4th November 1924, and all sanitary works and repairs appertaining thereunto, except those which lay in the civil district of Montgomery, were transferred to the control of the No. II Sanitary Provincial Division, Lahore, the Montgomery District having been included within the charge of the Sanitary Provincial Division, Multan. The designations of No. III-A and III-B. Sanitary Sub-Divisions were changed to Nos. II-A and II-B.

The subordinate and office staff of the Sanitary Engineer was considerably strengthened during the year so as to cope with the increasing demand for the designing and the execution of sanitary schemes in the whole province.

Miscellaneous Work.

About 75 different towns and villages were inspected by the staff in connection with sanitary schemes during the year.

Sketch and detailed projects of the approximate value of Rs. 1,25,00,000 were prepared and scrutinized.

Boring Work.

About 14 borings were done during the year with improved methods and new plant in connection with water-supply schemes.

General.

One year again has elapsed and the Lahore Municipality have not yet carried out the scheme of storm drainage of the area from Davis Road to Ferozepore Road including the Government House grounds, which have been flooded several times for want of improvements to the existing storm channel. The Sanitary Engineer having drawn attention of the Sanitary Board to the great urgency of this matter, the latter have agreed to give a grant-in-aid of Rs. 20,878 to the Municipal Committee, Lahore, provided the Committee were prepared to take up the scheme at once. Nothing was, however, done during the year under report.

(2) Sanitary Works.

No. 1 Sanitary Provincial Division.

Executive Sanitary Engineer.—Mr. J. A. R. Bromage, A.M.I.C.E.

Sangla Water-supply—(Rs. 42,634).—This scheme was completed in February 1924, and is being maintained for one year by the department. All pipes and machinery were purchased by the local body, and the figure given above represents estimate for construction work only. The project supplies public stand-posts only, and experience has shown that the allowance of 5 gallons per head daily has not been approached, although supply is being given for several hours entirely in accordance with the wishes of the local body.

Jandlianwala water-supply (Rs 1,10,996).—This project was completed in December 1924, but was sufficiently far advanced for water to be given to the town as from 1st October 1924, since when the running has been in the hands of the department. A supply of 10 gallons a head for a population of 5,000 is provided, but experience over the winter months with a 24 hours supply and a population of 3,700 shows a consumption of 4 gallons per head daily with a public stand-post supply.

Considerable trouble was experienced with the original contractor, who was subsequently replaced and the work completed in a satisfactory manner. Certain constructional points of this project are of interest, among which may be included a reinforced concrete dome roof to

the service reservoir 40 feet above ground, the use of the steel frame windows and provision of telescopic draw-off arrangements for the filters.

Bhalwal Drainage (*Rs.* 33,103).—This work will be completed early in 1925. The project provides only for drains, and no street pavements, which prevents a proper finish to the work being given.

Phullerwan Drainage (*Rs.* 59,395).—This project was prepared several years ago, but construction was only commenced recently and was completed at the end of 1924. A more or less complete revision of the whole project was carried out during the construction period.

Maghiana Drainage (*Rs.* 2,97,605).—Progress on the intramural drains and the completion of the Wakefield storm nullah have been carried out during the year. Construction of the intercepting drains and outfall works has been held up owing to land acquisition difficulties. These, however, were settled in 1924, and tenders for the construction of these works were received in December 1924.

Sargodha Waterworks (*Rs.* 3,68,926).—Work on construction of this project commenced in July 1924, and it is hoped to have the scheme running early in 1925.

Phullerwan Water-supply (*Rs.* 45,479).—Work on this project commenced in August 1924, and it is hoped to have the work finished early in 1925. An interesting constructional detail in this work is the adoption of circular filters, thus considerably reducing the amount of masonry required in their construction.

Sillanwali Water-supply (*Rs.* 51,327).—Orders to commence the work were received in 1924, but, as only half the contribution money was forthcoming in that year, at present only the ordering of material has been put in hand.

Campbellpur Water-supply (*Rs.* 1,87,785).—Work on this project commenced in 1924, pipe laying was completed in the city in 1924 and the service reservoirs are nearing completion. The boring for the tube-well has been completed, and, after the tube has been fixed, the engine-house will be built. All machinery has arrived.

Campbellpur Drainage (*Rs.* 80,932).—This project is well in hand, and is the first in the Punjab where Punjab type drains of cement concrete will be used throughout.

Rawalpindi Water-supply (*Rs.* 6,43,133).—A contribution of Rs. 3,05,000 has been received from the local body, and the pumping machinery and steel service reservoir have been ordered. Much material has arrived, and the construction of all buildings at the head-works is in hand. Provided funds are forthcoming, it is hoped to have the project completed by the end of 1925.

Trial Borings.—Two trial borings have been successfully completed, one at Musa Khel and one at Kharian, thrust method having been employed in both cases.

Sialkot New Tube-wells (*Rs.* 13,078).—This project is in hand, but the fixing of the strainer is held up owing to the non-arrival of certain special pipes.

No. II Sanitary Provincial Division.

Executive Sanitary Engineer in charge.—Mr. D. A. Howell, A. M. I. C. E.

Government House, Lahore.—A new dhobi ghat and motor washing platform were built and connected to the sewerage system. The sub-soil sullage disposal arrangements, which had proved successful in eliminating the smell nuisance, were extended.

The storm water drain in Government House compound required remodelling, but, as the Lahore Municipal Committee have not carried out their proposal to improve the main drain from Davis Road to Ferozepore Road, this work has had to be deferred till next year.

Borstal Institution.—The water-supply for this institution, comprising a new tube-well and incidental works, was completed and handed over to the jail authorities, and there is now no shortage of water in this institution.

Punjab Mental Hospital.—Drainage and water-supply extensions, of a total estimated value of over Rs. 45,000, have been under course of construction, and were nearly completed.

Intermediate College for Women.—The construction of a new tube-well for the water-supply of this institution was completed and handed over to the college authorities.

Mayo Hospital and King Edward Medical College Water-supply Extensions.—The construction of a comprehensive scheme of water-supply, estimated to cost Rs. 71,328 for these institutions, was started, and will be completed in 1925. The scheme consists of a tube-well, with oil-engine-driven pumping plant, storage tanks on the roof of the hospital and distribution arrangements.

Shahdara Water-supply for Industrial Buildings.—These works, estimated to cost Rs. 44,730, were in course of construction during the year. The distribution system and over-head

reservoir were almost completed. The non-arrival of the softening plant from England held up further progress.

Montgomery Central Jail.—A scheme, estimated to cost Rs. 25,247, for the drainage of the jail was carried out nearly to completion during the year.

Jullundur City Jail.—Two works of water-supply improvements for the jail were taken in hand, *viz.*—

(*i*) improvement of the factory well—Completed and successful ; and

(*ii*) conversion of the main well into a tube-well equipped by a three-throw capstan pump, storage tanks, etc.—About to be completed.

These works have placed the jail water-supply on a sound footing, and there will be no further shortage of supply.

Ambala City.—The running and maintenance of the Sarangpur pumping station and 40 feet diameter well were in the charge of this division and upwards of 29,438,050 gallons of water were supplied to the Ambala City Municipal Committee at annas 5 per thousand gallons from this source during the year. The duplication of the pumping plant will be taken in hand in 1925.

Palwal.—A trial boring 300 feet deep was commenced near the end of the year ; this work will be completed in 1925.

Contribution Works.

Lahore.—Trial Boring in Minto Park.—A trial boring 550 feet deep was put down in Minto Park to test the nature of the sub-soil and the quality of the sub-soil water. The bore was successful, and disclosed the presence of good sweet water-bearing sands right down to full, depth. This result shows that ample supplies of good water are obtainable from the deep subsoil at Lahore. The bore was estimated to cost Rs. 5,093.

Pattoki Mandi.—A scheme, estimated to cost Rs. 15,651, for drain-flushing arrangements was commenced during this year, and has been brought nearly to completion.

Khem Keran.—The Khem Keran drainage scheme, estimated cost Rs. 74,129, was completed during the year and was handed over in working condition to the local body for maintenance.

Jandiala.—The Jandiala extramural drainage scheme, estimated to cost Rs. 43,072, was completed during the year and was handed over in working condition to the local body for maintenance. The total expenditure up to the end of the year 1924 was Rs. 38,302.

Rewari.—The water-works extensions, estimated to cost Rs. 29,035, consisting of a fifth well and suction tunnel, were commenced during this year. Good progress has been maintained on the well-sinking operation, and the work will be completed in 1925.

Gurgaon District.—The Gurgaon rural water-supply scheme estimated to cost Rs. 55,622, was commenced in May 1924. A well at Basantpur has already been completed. A storage tank at Jodhra near Rewari is approaching completion. Three other works in the villages will be carried out in 1925.

Muktsar.—The Muktsar water-supply scheme, estimated to cost Rs. 2,97,944, which was commenced in 1923, was continued throughout the year 1924, and good progress was maintained, it being anticipated that the whole of the works will be finished in April 1925.

Jullundur City.—The construction of the Jullundur City drainage scheme, estimated to cost Rs. 7,57,923, was proceeded with, and drains and pavements in eight blocks, and also in Nile Mahal and Mohalla Karar Khan, were completed during the year. The total expenditure up to the end of 1924 was Rs. 5,48,826.

Hoshiarpur.—The Hoshiarpur drainage scheme, estimated to cost Rs. 1,81,580, was completed, and handed over to the local body on the 1st December 1924. Certain extra works of paving and draining are now to be undertaken out of the savings effected on the original scheme.

Ambala City Southern Outfall Pumping Station.—The construction of a new pump-house and the installation of a new pumping plant, estimated to cost Rs. 9,990, was commenced.

Kharar.—As the result of a number of trial borings, a site was fixed for an experimental well in connection with the proposed water-supply of Kharar. The contract for the construction of the well, estimated to cost Rs. 7,988, was let towards the end of the year.

Ludhiana.—The work of the overhaul, repairs and replacements of the pumping plant of the Ludhiana Water-works, estimated to cost Rs. 16,799, was commenced in October 1924, and will be completed in 1925.

Kaithal.—In connection with the proposed water-supply scheme, a trial bore was put down to a depth of 288 feet at Kaithal in the hope of proving sweet water-bearing strata, but no such strata were found.

Rohtak.—In connection with the proposed water-supply scheme, a trial bore was put down to a depth of 315 feet in Civil Lines, Rohtak, but proved a failure as no sweet water-bearing strata were found.

Eminabad.—The Eminabad drainage scheme, estimated to cost Rs. 33,741, was commenced towards the end of the year, and will be completed in 1925.

Multan Sanitary Provincial Division.

Executive Sanitary Engineer—Mr. G. T. Pound, A. M. I. C. E.

Multan Water-works (*Rs.* 12,57,637).—Work on the water-supply for the city of Multan was started at the beginning of the year, and good progress has been made. A trial bore was first sunk to a depth of 360 feet to explore the sub-soil. A bore-pipe for one of the permanent tube-wells has been sunk, and the construction of the service reservoir on the top of the old fort mound has been started. The pipes for about a fifth of the distribution system have been laid.

STATISTICS OF PUNJAB WATER-WORKS FOR THE YEAR ENDING 31st MARCH 1924.

No.	Name of Municipality.	Population at the Census of 1921.	Average daily quantity of water pumped during the year ending 31st March 1924.	Average daily supply per head of population.	Receipts.					Expenditure.									Balance.		Remarks.
					Water-rate.	Sale of water.	Rent of meters.	Other receipts.	Total receipts.	Establishment.	Pumping.	Intake.	Settling tank and filter.	Distribution.	Repairs.	Water analysis.	Miscellaneous.	Total expenditure.	Credit balance.	Debit balance.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
			Gallons.	Gallons.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1	Ambala (Handesra)	28,581	248,644	8·70	...	10,293	...	...	10,293	12,586	13,525	359	...	2,884	3,767	...	3,837 (a)	36,958	...	26,665	Besides above the Committee paid Rs. 8,099-11-9 as repayment of Water-Works Loan and Rs. 552-13-8 on new additional lines.
2	Amritsar ...	157,031	1,928,382	12·28	...	99,947	1,495	1,151	1,02,593	18,366	50,736	...	...	2,743	2,376	...	...	74,221	28,372	...	
3	Dalhousie ...	1,457	30,000	20·59	4,440	...	...	...	4,440	408	...	62	...	17	17	...	...	504	3,936	...	
4	Dera Ghazi Khan	20,731 Municipality. 3,223 Cantonment	120,965 In Cantonment.	5·83	...	2,118	126	...	2,244	3,572	2,971	...	...	...	1,553	...	906 (b)	9,002	...	6,758	(1) The water is supplied by gravity and not pumping.
5	Dharmsala	8,700	20,000 to 25,000	About 7 gallons in Cantt.	3,966	...	...	...	3,966	288	...	...	...	...	2,763	...	...	3,051	915	...	
6	Gojra ...	7,622	90,000	12	...	839	...	...	839	1,825	3,144	...	...	1,016	1,009	...	6,076 (c)	13,070	...	12,231	
7	Jaranwala ...	4,000	60,000	15	...	922	...	...	922	1,453	2,323	...	500	521	891	658	...	6,346	...	5,424	(2) No meter on line, water always short in hot weather, supply line is of too small diameter.
8	Lahore ...	257,295	3,120,067 700,000	12·12 2·6	...	2,36,891	303	...	2,37,194	25,775	1,23,860	810	...	5,557	23,290	...	...	179,292	57,902	...	
9	Ludhiana ...	51,880	658,385	12·69	...	24,184	...	...	24,184	8,092	28,551	...	...	...	...	...	...	36,643	...	12,459	
10	Lyallpur ...	28,136	329,355	11·70	...	22,612	...	...	22,612	7,203	5,584	4,600	228	5 695	325	...	...	23,635	...	1,023	
11	Murree ...	2,397	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
12	Pind Dadan Khan	9,919	23,040	2·32	...	1,186	...	...	1,186	1,051	3,138	...	...	346	180	...	...	4,715	...	3,529	
13	Rawalpindi ...	55,251	526,292	9·52	...	6,135	796	...	6,931	4,242	..	...	...	17,595	...	...	...	21,857	...	14,906	
14	Rewari ...	23,129	125,000	5·4	...	...	...	...	...	6,394	8,207	...	15	...	5,229	...	(d) 27,000 (e) 4,610	51,455	...	51,455	
15	Sargodha ...	18,000	128,044·30	7·11	8,094	4,475	185	81	12,805	5,322	9,552	78	21	99	745	...	(f) 953 (g) 174	16,944	...	4,139	
16	Simla ...	26,149	283,835	10·85	1,84,062	53,928	8,221	3,138	1,99,349	66,554	46,617	...	1,689	19,031	849	...	...	1,34,740	64,609	...	
17	Sialkot ...	56,018	500,000	9	...	10,954	...	32	10,986	10,400	58,490	...	...	1,018	17,541	16	..	87,465	...	76,479	
18	Toba Tek Singh ...	5,041	7,128	1·41	1,176	502	...	...	1,678	1,372	3,060	...	...	...	748	...	1,750	6,930	...	5,252	

NOTE.—Figures for the columns marked * have not yet been supplied by the Municipalities.

(a) Pumping charges and cost of water from Firangi pur well. (b) Departmental charges. (c) Depreciation fund.
(d) Construction of a new well. (e) Construction of Water-Works road. (f) Water price. (g) Inspection fee.

AMAR NATH NANDA,
Offg. Sanitary Engineer to Government, Punjab.

APPENDIX C.

Copy of a Memorandum regarding Relapsing Fever in the Punjab by Lieutenant-Colonel C. A. Gill, I.M.S., D.P.H., D.T.M. & H., Offg. Director of Public Health, Punjab.

Before replying to the questionnaire issued by the Office International d'Hygiene Publique it is expedient to review briefly the history of relapsing fever in the Punjab.

Prior to the annexation of the Punjab by the British Government in 1847 no information is available in regard to the occurrence of relapsing fever in this Province, but within a few years of the British occupation Medical Officers of the Army began to report the occurrence of a febrile disease resembling relapsing fever. In the year 1852 Farquahar and Lyall as the result of an investigation of an outbreak of fever at Peshawar definitely established the presence of a fever identical in all respects with the European type of relapsing fever in the north of the Punjab. Beyond scanty references which merely suggested that a similar fever prevailed in other parts of the Province, little or nothing is known in regard to the history of the disease during the period from 1852 to 1867. From the latter year, however, up to the present time, the Public Health Reports of the Punjab together with the special reports submitted by officers of the Medical and Sanitary Departments to the Provincial Sanitary Commissioner make frequent reference to the occurrence of outbreaks of this disease. The writer has elsewhere detailed the result of an analysis of these reports from a scrutiny of which it is evident that relapsing fever under the name of "contagious", "jail" or "famine" fever has repeatedly occurred in the Punjab in the form of widespread and severe epidemics. It is unnecessary to detail here the grounds on which this conclusion was reached and it will suffice to state that by means of certain indices (termed the "fever index" and the "respiratory index" of relapsing fever) it was found possible to re-construct in some detail the history of the disease in the Punjab during the past 54 years. This preliminary study derived its importance from the fact that prior to its publication little or nothing was known in regard to the occurrence of relapsing fever, either as an endemic, or an epidemic during modern times. A few outbreaks of the disease were reported from time to time, but in the vast majority of cases the disease was mistaken for malaria or was regarded as a "fever" of an undetermined nature. No attempt was made to diagnose the disease with the aid of the microscope and until a few years ago modern methods of treatment had never been adopted. Mainly as the result of this investigation, relapsing fever has attracted enhanced attention during the past few years and it is now definitely recognised that this disease is widely endemic in the Punjab and that it is liable to give rise to great epidemics. Since the publication of the preliminary investigation in 1920 more detailed enquiries have been carried out which had for their object the determination of the circumstances associated with the occurrence of epidemics of this disease. It is now proposed to detail some of the points elucidated by these recent investigations and if the answers to the questionnaire appear to be couched in unduly categorical terms it should be understood that this mode of reply has been adopted solely in the interest of brevity and of clearness.

The answers to the questionnaire thus merely represent the conclusions (without the facts upon which they have been formed) reached in an investigation which is at present incomplete. Nevertheless, although no claim is made that these conclusions are final, it is thought that further investigation will confirm the accuracy and extend the scope of the main facts recorded in this note.

QUESTIONNAIRE RELATIVE TO RELAPSING FEVER.

1. Does relapsing fever exist in your country ?

Relapsing fever is endemic in the Punjab and occasionally gives rise to great epidemic outbreaks. During the past 54 years major epidemics involving almost the whole Province occurred in the year 1869, 1878, 1906, 1920. In addition minor epidemics confined to a portion of the Punjab have occurred in many other years and, if recent events may be taken as a guide, it seems probable that relapsing fever has never been absent from the Province since the year 1867 and that it has prevailed in epidemic form in some part of it on frequent occasions. It is concluded therefore that the disease is permanently endemic in the Punjab and that major epidemics merely represent the occurrence of outbreaks of exceptional magnitude and severity. Apart from the endemic prevalence of the disease there is also evidence that infection is repeatedly imported both from the south, more especially from the United Provinces, and from the north through the passes from Afghanistan, Turkistan and Central Asia. It is impossible to determine the precise part played by importation in maintaining the presence of a reservoir of infection in the Punjab; but, although no evidence can be given in support of this view, the opinion has been formed that importation is a factor of relatively small importance and that the epidemics are mainly dependent upon the emergence in epidemic form of an essentially endemic disease.

2. What is the presumed origin of the first case seen? In what year did relapsing fever appear or was it recognised for the first time ?

This question has already been sufficiently answered.

3. What is the type observed ?

From the clinical aspect the fever is invariably of the European type of relapsing fever. The writer has seen no other form and all accounts agree in regarding the local disease as typical of the European form of the disease. The parasite is morphologically identical with *S. Obermeiri* and the evidence all points to the louse as the transmitting agent.

4. What is the special aspect of the malady ?

It has not been possible to keep cases under constant observation, but such observations as have been made suggest that the clinical character of the disease conforms closely to the European type. The usual number of relapses is two, but three relapses sometimes occur. It is necessary to emphasise the fact that in mild infections no relapse may occur, whilst in severe infections death frequently takes place at the time of the first crisis. It is difficult therefore to give precise figures in regard to the number of relapses. In mild epidemics relapses are relatively rare, in epidemics of moderate severity they are more numerous whilst in severe epidemics the average number of relapses is further increased, although owing to the frequency of death at the time of the occurrence of the first crisis in severe infections, relapses are less frequent than they would otherwise be.

As regards the clinical features, no statistics can be given but the frequency of epistaxis and the occurrence of broncho-pneumonia constitute two striking features of the disease. Jaundice is also common in severe attacks. Abortion in pregnant women is also a marked feature of the disease.

5. Geographical distribution according to the types observed ?

As already stated there is only one type of the disease in the Punjab. The disease is widely distributed throughout all parts of the Province both in the hills and in the plains.

6. Agents of transmission (known or believed) to man according to type.

On epidemiological grounds the facts point solely to the louse as the agent of transmission. Smears made from lice removed from relapsing fever cases are frequently found to contain spirochætes. It is improbable that ticks and bugs, owing to their rarity, play any appreciable part in the spread of the disease in this Province.

7. Can one determine duration of infection in louse or tick ?

No observations have been made.

8. Is Spirochæte hereditarily transmissible in the louse tick, *e.g.*, from louse to nit ; from tick to egg ?

Here again no first hand observations are available.

9. What is the mode of human infection ; by puncture or abrasions ?

The epidemiological facts do not appear to be consistent with the view that the transmission of this disease is in all cases or even in most due to the contaminative method. A few observations that have been made in connection with the transmission of the disease by the louse would appear to confirm the accepted view that infection is not transmitted by the bite of the insect, but it does not follow from these observations or even from the classical experiments which are held to have established the contaminative method of infection in relapsing fever that the latter constitutes the sole or even the main mode of transmission. It is in fact difficult to believe that the lice-tolerant inhabitants of Punjab villages, to whom the bite of the louse causes neither irritation of the skin nor scratching, are likely to become almost universally infected during the course of an epidemic. The epidemiological facts associated with an epidemic of relapsing fever strongly suggest that nature has provided a more biologically perfect mode of transmission than that associated with the accidental squashing of lice by the finger or the contamination of abrasions by their excreta. In this connection it is pertinent to remember that until Bacot discovered the mechanism of transmission of plague by the rat-flea it was held that the transmission of this disease was due to precisely the same mode of infection as is now held to account for the transmission of relapsing fever. It is therefore tentatively assumed that some unknown biological process, such as occurs in connection with the transmission of malaria, plague, filariasis, and trypanosomiasis, is concerned in the transmission of relapsing fever. There is of course no reason to doubt that transmission of infection may take place by the contaminative method as indeed may occur in the case of plague, but it is suggested that this method does not represent the truth, the whole truth and nothing but the truth. It has been thought necessary to emphasise this point because it would appear that the elucidation on the precise part played by the louse in the transmission of relapsing fever is the most urgent outstanding problem connected with the bionomics of this disease.

10. Duration of incubation in accordance with type ?

I can give no useful answer to this question.

11. When does man show spirochætes in the blood and for how long is he a reservoir of infection ?

As the result of an examination of the ordinary thin blood film spirochætes are usually found in the blood only during the febrile period, they disappear rapidly after the crisis and re-appear, although in smaller numbers than formerly, during relapses. This method of examination is, however, insufficient to determine the presence of spirochætes in small numbers and it is consequently impossible to state how long man may harbour parasites. It has, however been found by means of using a modified form of Ross's thick film that spirochætes can be detected in thick films, when they are apparently absent in ordinary thin films. It may also be remarked that, on several occasions, when examining blood for malaria parasites in localities where relapsing fever was not known to exist, spirochætes have been found in scanty numbers in the blood of *apparently healthy children*. As regards the reservoir of infection no definite conclusion has been reached but, in view of the above observations and of certain other epidemiological facts, it seems not improbable that man may constitute an important reservoir of infection. It is suggestive in this connexion that in other diseases (such as malaria, plague, filariasis and trypanosomiasis) a mammalian host functions as the reservoir of infection. This important point requires further investigation but the undoubted occurrence of mild infections in children renders it not improbable that the disease may be carried over from one season to another by man.

11-A.—Age Incidence.

Cragg has shown that the age incidence of mortality in relapsing fever is peculiar since the mortality rate in children is scarcely raised, whilst in the 20 to 40 age group it is markedly enhanced. Our observations confirm this view to some extent, but it has been found that the mortality in all age groups is raised in a manner which causes the curve of mortality to resemble an exaggeration of the normal curve ; nevertheless the mortality in the 20 to 40 age group is *relatively* enhanced to a slight degree (Cragg's conclusions in this matter are not entirely convincing since he was dealing with an area in which plague was prevalent at the time). The main point which recent investigations in the Punjab has brought to light in connexion with the age incidence of the disease is the fact that the *age incidence of mortality* throws no light upon the *case incidence of the disease*. In villages in which relapsing fever is present in epidemic form it is customary to find that all the inhabitants of infected houses—men, women and children—are sooner or later affected. It is in fact a common observation that no single inhabitant of an infected house escapes during the course of an epidemic. When one considers the condition in which the inhabitants of Punjab villages live, where lice infestation is usual, where all use the same room, the same clothing, and often the same bed, it would indeed be remarkable if only certain age groups were liable to acquire infection. Unfortunately under the conditions in which the investigation has been carried out it has not been possible to obtain accurate figures bearing upon the case incidence of the disease, nevertheless it is difficult to avoid the conclusion, reached as a result of field observations, that, whilst all age-groups are equally liable to suffer during an epidemic, the disease is relatively mild in infants and young people, whilst in adults the mortality is considerable. It is therefore possible that the characteristic *age incidence of mortality* in relapsing fever does not, as has been assumed, indicate any peculiar liability of adults to acquire the disease, but is representative of the fact that, as compared with young children, the case mortality in the 20 to 40 age-group is relatively high.

12.—What factors assist in epidemics ?

A clear distinction must be drawn between the factors which assist in the *spread* and the factors concerned in the *causation* of epidemics. There is no doubt that scarcity and famine and the dispersive movements of the population to which they give rise play an important part in the *spread* of the disease. Some but not all of the great epidemics of the Punjab have been associated with famine, but it is clear that famine is not an *essential* factor in determining the occurrence of these outbreaks. The last epidemic in the Punjab, for example, occurred during a period of plenty. The influence of over-crowding, which is usually regarded as an important factor in determining the incidence of the disease is by no means obvious, though it is clear that the social habits of the people of the Punjab (to which reference has already been made) are highly conducive to the spread of infection. In this sense over-crowding does facilitate the spread of the disease and therefore is a factor concerned in the occurrence of epidemics but, as will shortly be mentioned, the seasonal periodicity of the disease does not correspond with that period of the year (the winter) in which congestion is most intense. It has been mentioned that lice infestation is almost universal amongst the rural population and it should be added that Indian ideas of personal cleanliness are not incompatible with "lousiness". There is therefore, no reason to believe that absence of facilities for bathing is a factor of material importance in favouring the occurrence of relapsing fever in the Punjab. On the other hand, there are many facts pointing to the conclusion, other things being equal, that relapsing fever is relatively more common amongst that section of the community which is most heavily infested with lice. In this connexion the following points may be mentioned :—

(1) The poorest inhabitants of villages constitute the most heavily infected section of the population. In any given village this section of the community is almost invariably the first to be attacked by the disease.

(2) Relapsing fever in the Punjab is essentially a disease of the rural population who, speaking generally, are less cleanly and more lousy than the inhabitants of towns.

(3) The urban population (even in the case of towns located in the centre of epidemic areast) have escaped in a remarkable manner during recent epidemics, and it is thought that this circumstance is explained by the fact that the towns-man is on the whole better off, more cleanly and less lice-infested than the villager.

(4) Hindus (who are mainly found in the towns) have suffered to a relatively small extent during recent epidemics, and it is thought that this circumstance is due to the fact that they constitute the more well-to-do section of the population.

As regards the circumstance concerned in the *causation* of epidemics none of the above factors can be regarded as of more than secondary importance. The people themselves say that they have always been lice-infested, that scarcity and famine is of common occurrence, that social habits and customs have not changed since time immemorial, yet, they add, no previous epidemic of relapsing fever has occurred during the life-time of the present generation.

It is obvious therefore that we must look elsewhere for an explanation of the cyclical periodicity of the great epidemics that sweep over the Punjab from time to time. An answer to this riddle is yet to seek but, precedent to its discovery, it is essential that all the circumstances concerned in the mechanism of these epidemics should be clearly elucidated.

12-A. Seasonal periodicity.

The precise nature of the seasonal periodicity of relapsing fever in the Punjab has been the subject of prolonged investigation. It is now clear that, so far as *mortality* is concerned, the epidemic ordinarily reaches its maximum intensity during the months of May and June. But this is not the whole truth for it has recently been ascertained that the disease commences slowly and insidiously in the preceding autumn and continues without appreciably increasing in severity throughout the winter. In the month of March or April the disease begins to increase in frequency and severity, whilst in May the mortality curve exhibits a rapid rise which is maintained until about the end of June when it is followed by an equally sharp decline. The disease, *so far as mortality is concerned*, completely disappears in July and it is *apparently* absent until the month of October when it again re-appears, but with greatly reduced intensity. The above constitutes the characteristic history of the disease in any given village but for larger areas the course of events is apt to be obscured by reason of the slow spread of the epidemic, which, may be likened to a slow fire which, blazing fiercely for a time, burns itself out and then flares up in *contiguous areas* during the following year.

So far as any given village is concerned the disease exhibits marked epidemical characteristics during one year followed during the two or three succeeding years by relatively mild recrudescences, but since the spread of the disease exhibits creeping characters a given district may experience severe epidemics of relapsing fever during two or even three consecutive years. For example, in 1922 the northern half of a certain district was involved in an intense epidemic ; in the following year, although the disease re-appeared in a certain number of villages in this area, no widespread epidemic occurred, but an intense epidemic broke out in the *southern* half of the district and in other areas in close communication with the epidemic focus of the previous year. It thus comes about that, taking the Punjab as a whole, the appearance of a cyclical epidemic is associated with the occurrence of a high mortality from relapsing fever in some parts of the Province over a period of about five consecutive years. It is not proposed to deal here with the cause of the seasonal periodicity of these epidemics, but it should be added that no marked seasonal variation in the prevalence of lice has hitherto been noted whilst the season of the year in which these epidemics reach their maximum intensity is precisely that in which intense dry heat is at its maximum and the congestion of human habitations is at its minimum. In these circumstances it is difficult to believe, as stated by Cragg, that climatic and meteorological conditions, and more especially the relative humidity of the atmosphere, is the main factor determining the seasonal incidence of this disease.

13. Do certain affections seem causally related to relapsing fever, although they precede, accompany or follow the recurring signs (*e.g.*, typhus) ?

Throughout the history of relapsing fever in the Punjab every great epidemic has been associated with the occurrence of typhus fever in epidemic form. These two diseases do not, however, exhibit precisely the same distribution, for, although typhus fever frequently occurs in association with relapsing fever, the former disease is confined to the montane and submontane tracts along the northern and western borders of the Punjab. Typhus fever, moreover, exhibits a distinctive seasonal periodicity since its period of maximum prevalence is in the winter, that is, during the months of December, January and February, whilst as already stated relapsing fever is at its maximum during the months of May and June. The situation may be summarised by stating that typhus fever and relapsing fever exhibit the same cyclical periodicity but a distinctive seasonal periodicity and (although they overlap to some extent) a different geographical distribution.

14. How can one explain the sudden decline in the morbidity curve of recurrent, when typhus continues to evolve ?

This phenomenon has not been observed in the Punjab ; on the other hand it is observed that in the northern part of the Province, where typhus and relapsing fever both occur during the cold weather, the former disappears with the onset of warm weather, whilst relapsing fever continues to evolve. Typhus fever in the Punjab is essentially a winter disease whilst relapsing fever, although it occurs in the winter, is more particularly prevalent during the spring and early summer.

15. Does it rage in a massive and widespread epidemic or in localised outbreaks ?

The usual character of relapsing fever epidemics in the Punjab is, as already stated, a massive epidemic which involves almost every village over a wide area. Occasionally it does occur as a localised epidemic usually amongst those in indigent circumstances, but whilst it is probable that these localised epidemics are more frequent than is at present known, they do not constitute a conspicuous feature of the disease in the Province.

16. Numbers of cases declared for a definite period ?

No definite figures can be given, but it is certain that in two districts of the Punjab where the disease has recently been prevalent as an epidemic very few inhabitants of the infected villages escaped infection.

17. Percentage average death by recurrent fever amongst observed cases ?

Vandyke Carter states that in the great epidemic of 1877 in the Bombay Presidency the death-rate amongst the patients treated by him was 18 per cent. A census taken in certain villages of the Punjab after the conclusion of an epidemic 1922 showed that (excluding cases treated by arsenical compounds) the death-rate was 15 per cent. On the other hand in local epidemics among half-starved labourers the death-rate may be as high as 50 per cent. In 1923 the death-rate amongst 28,830 verified cases was 26 per cent. The death-rate of relapsing fever is therefore a variable factor and, for reasons already mentioned, it is clear that it may vary greatly in accordance with economic conditions, social status and the age composition of the population.

18. Percentage average deaths by recurrent fever by report for the grand total of population ?

It is impossible to give any useful answer to this question, as in no year is it likely that the death-rate from this disease would be the same. The writer however estimated that during the last widespread epidemic in the Punjab in the year 1920, which involved about two-thirds of the Punjab, approximately 37,000 deaths from relapsing fever occurred amongst a population of about 13 million. In other words during this year nearly 3 per cent. of the population succumbed to the disease. This figure however is probably an under-estimate since it only included the deaths which took place during the height of the epidemic in May and June, 1920.

19. Treatment which have given the best results in each type ?

Only two drugs have been largely used in treating relapsing fever in this Province—neo-salvarsan and nov-arseno-billon. Precise figures are not at present available but during the past two years some 26,000 people have been treated by intravenous injection with one or other of these drugs. Nov-arseno-billon was generally used but recently neo-salvarsan, owing to its cheapness, has been substituted. Both these drugs have given good results and one of the satisfactory features of the situation is the popularity of this form of treatment. Some medical officers however consider that nov-arseno-billon is slightly more effective than neo-salvarsan.

20. Duration of the immunity conferred by a first attack according as to whether the cure occurs spontaneously or after treatment ?

Numerous instances have occurred of second attacks of relapsing fever within three months of recovery of untreated attacks, but this is not common ; on the other hand second attacks (apparently due to fresh infection) are of common occurrence amongst those who have been treated by arsenical compounds. No data can at present be given, but the opinion has been formed that whilst some degree of relative immunity is conferred as a result of untreated attacks of relapsing fever, resistance to fresh infection is less marked in those in whom the disease has been cut short by treatment with arsenical compounds.

21. Most efficacious prophylactic measures ?

In its widest sense prophylactic measures must be held to include the prompt recognition of the disease, its effective treatment and the elimination of carriers of infection. An attempt has been made to attack the disease in the Punjab from all these aspects. It was first necessary to spread knowledge both amongst the medical profession and the general public regarding the nature of the disease, its mode of spread, and methods of prevention and treatment. With this object in view, leaflets and posters have been widely circulated, a standard lecture has been drawn up and lantern lectures (the lanterns have been kindly supplied by the Indian Red Cross Society) have been

given in many parts of the Province. For the prevention of the disease a disinfestation campaign has been organised and carried out, but since almost every Punjabi villager is "lousy" it is clear that complete success cannot at once be expected. The first problem was to devise some simple and efficacious method of destroying lice and their eggs that could be applied in Indian villages. The following methods have been adopted with this object in view :—

(1) Serbian barrel method.

(2) The boiling garments in water containing soap and a small quantity of crude soda.

(3) Ironing of blankets and garments unsuitable for boiling.

(4) The ghurrah method.

All these methods have been carried out on systematic lines under proper supervision. Much is hoped for from ghurrah method of disinfection recently devised by Caption S. N. Hayes, I. M. S., Civil Surgeon, Dera Ghazi Khan, but it is, however, not possible to state, owing to the immense area to be covered, to the suspicions of an ignorant peasantry and to practical difficulties, that these measures have at present enabled any real control to be established over epidemics of relapsing fever. During the past 2 years one or other of the above methods have been extensively tried but whilst a determined effort has been made and some progress has been achieved it will require persistent efforts continued over many years before the practical difficulties attending the mitigation and prevention of these devastating epidemics can be overcome.

22. Given a character eminently diffusible, would there be no place for preventative international sanitary measures against relapsing fever with a view to safeguarding the public health against the importation and propagation of this formidable disease?

The answer to this question must depend upon circumstances of time, place and the standard of civilization. It is clear that man is the carrier of the disease either in his own person or by means of his ecto-parasites and it consequently follows that the disinfestation of all individuals leaving an infected area is a preventive measure of the greatest value. On the other hand amongst those nations whose standard of civilization renders it unlikely that they will act as carriers the need for public as opposed to personal safeguards is less obvious. In the case of the Punjab the institution of any organised system of disinfestation or any form of quarantine to prevent the spread of infection would be so difficult as to be almost impracticable and, in view of the fact that the disease is widely endemic in the Province it is not considered that the adoption of measures of this nature, which would gravely interfere with trade and communications, would be justified by the result.

APPENDIX D.

Copy of a Memorandum regarding rice cultivation and malaria in the Punjab being the reply to a questionnaire issued by the Italian Government for submission to the International Congress on Malaria to be held at Rome in October 1925, by Lt.-Col. C. A. Gill, I.M.S., D.P.H., Officiating Director of Public Health, Punjab.

1. The present area of land under rice cultivation ?

In the Punjab there are two harvests, the spring harvest (*rabi*) and the autumn harvest (*kharif*), the former being reaped in April and the latter in October. The *rabi* crops comprise wheat, barley, pulse, and oilseeds, and the *kharif* crops in the order of their acreage, spiked millet, cotton, maize, *jowar*, rice and sugarcane. The rice crop therefore, from the agricultural point of view, is of relatively small importance in the Punjab. But although only about a million acres are sown each year, the rice crop is of peculiar importance from the point of view of malaria on account of the fact that :—

(*a*) it is the only crop grown in water,

(*b*) its period of maturation corresponds precisely with the main malaria season.

This combination of circumstances is no doubt responsible for the view that the cultivation of rice in the vicinity of human habitations is inimical to health.

The area under rice cultivation in the Punjab during the year 1923 was 885,183 acres of which 691,176 acres were irrigated by perennial and inundation canals and by wells, and 194,007 acres were watered by rainfall—these two classes of crops being termed "irrigated" and "unirrigated", respectively.

2. Does the area under rice cultivation represent a reduction in relation to that previously under such cultivation and what were the reasons which led to this reduction ?

The area under rice varies slightly from year to year, the actual figures (in millions of acres) during the past ten years are given in Table A.

TABLE A.

ACREAGE UNDER RICE IN MILLIONS OF ACRES.

	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
Irrigated ...	·6	·6	·8	·7	·6	·7	·7	·6	·7	·7
Unirrigated ..	·2	·2	·3	·3	·1	·2	·2	·2	·2	·2
Total ..	·8	·8	1·1	1·0	·7	·9	·9	·8	·9	·9

The slight fluctuation in the acreage under rice is mainly due to fluctuations in the monsoon rainfall. In years when the monsoon rainfall (July-September) is in marked excess the canals are running full and more land can be irrigated, whilst abnormally heavy precipitation also renders some irrigated areas temporarily unsuitable for any crop except rice.

Hence in wet years, such as 1916 and 1917 the area under rice in *irrigated* tracts shows an increase. Excessive rainfall also permits land not otherwise cultivable (*barani*) to be sown with rice—hence an increase occurs in wet years in the area under rice in *unirrigated* tracts.

On the other hand in years when the monsoon rainfall is below normal the area under rice in the irrigated area is reduced because more valuable fodder crops are grown whilst the drought is responsible for the decreased cultivation of rice in unirrigated tracts.

3. Sanitary conditions of the rice-culture zone in respect to malaria ; disease and mortality through malaria ; clinical form of the same and its seriousness. Whether malaria existed previous to the cultivation of rice. Effect on rice cultivation on local endemicity of malaria ?

A mass of information has been collected during the past ten years in regard to part played by rice-cultivation in favouring malaria in the Punjab, but it is only proposed here to indicate briefly some of the conclusions that have been reached upon this subject.

The first point it is necessary to emphasise in connection with the study of malaria in the Punjab is the fact that a sharp distinction must be drawn between *endemic malaria*, which in this Province is associated with little or no *direct* mortality, and a fairly constant spleen-rate and *epidemic malaria* which, occurring once in every five or more years, is responsible for widespread sickness and mortality and a marked and sudden rise in the spleen-rate. The circumstances concerned in the production of these two manifestations of malaria are so distinctive that it is necessary to treat them separately in all epidemiological investigations.

It is proposed therefore to consider the influence of rice cultivation in relation to endemic and epidemic malaria respectively.

(A) Epidemic Malaria.

The epidemiological observations carried out in the Punjab during the past ten years have established the fact that a striking association exists between the amount of the monsoon rainfall and the incidence of epidemic malaria. This fact has been proved in a variety of ways, notably by means of calculating the co-efficient of correlation between the rainfall in July and August and malaria mortality in the following October and November. This figure has been calculated in the case of each of the 29 districts of the Punjab over a period of 56 years and also for the Province as a whole. It is unnecessary to quote the figures here and it will suffice to state that the provincial co-efficient of correlation being +0·681 (probable error ·002) indicates that the July-August rainfall is an important determining factor of epidemics of malaria in the Punjab

It has been mentioned that an excess in the monsoon rainfall is associated with an increase in the area placed under rice cultivation and it might therefore be held that rice cultivation is likewise conducive to epidemic malaria.

This view, however, becomes untenable when the precise relationship existing between rice cultivation and epidemic malaria in the various districts of the Province is examined. The relevant figures are given in Table B where the acreage under rice in each district of the Punjab is shown together with the "co-efficient of variability" of malaria mortality, which latter figure constitutes a convenient index of the relative liability of the different parts of the Province to experience epidemics of malaria.

TABLE B.

THE CO-EFFICIENT OF VARIABILITY OF MALARIA MORTALITY AND THE ACREAGE UNDER RICE IN EACH DISTRICT OF THE PUNJAB.

District.	Co-efficient of variability of malaria mortality 1868—1921.	Acres under rice in 1923.
1. Hissar	88	10,259
2. Rohtak	85	281
3. Gurgaon	98	43
4. Karnal	74	51,698
5. Ambala	74	55,302
6. Simla	...	1,107
7. Kangra	31	116,441
8. Hoshiarpur	63	29,522
9. Jullundur	86	1,260
10. Ludhiana	86	1,360
11. Ferozepore	103	10,010
12. Lahore	67	25,872
13. Amritsar	71	39,234
14. Gurdaspur	75	61,892
15. Sialkot	106	41,497
16. Gujranwala	99	108,450
17. *Sheikhupura	..	108,910
18. Gujrat	103	22,262
19. Shahpur	96	5,020
20. Jhelum	70	333
21. Rawalpindi	57	1,303
22. Attock	41	10
23. Mianwali	52	...
24. Montgomery	90	26,583
25. Lyallpur	65	2,885
26. Jhang	86	2,551
27. Multan	67	38,575
28. Muzaffargarh	60	49,513
29. Dera Ghazi Khan	72	70,010

*New district.

It will be seen from a scrutiny of this table that no obvious relationship exists between rice cultivation as measured by the number of acres under rice in 1923 and the relative liability of districts to epidemic visitations. Indeed there is some reason to think that rice cultivation might even be actually unfavourable to epidemic malaria; thus the district exhibiting the *lowest* co-efficient of variability (Kangra), or in other words the district exhibiting the smallest liability to epidemic malaria has a largest acreage under rice. Then again the

districts of Rohtak, Gurgaon, Jullundur and Ludhiana, in which the acreage under rice is negligible are liable to suffer from severe epidemics of malaria. Further facts derived from local investigations might be given in support of this view but it must suffice here to state that it seems justifiable to conclude that rice cultivation in the Punjab is not a factor of any importance in favouring the occurrence of malaria in epidemic form.

(B) Endemic Malaria.

The districts in Table B with a low co-efficient of variability of malaria mortality indicate the areas in which *endemic* as opposed to *epidemic* malaria is mainly encountered.

It will be seen that there is only one district (Kangra) in which during the past 56 years some degree of epidemic malaria has not occurred and as this district is also the chief rice-growing district in the province it might be inferred that rice cultivation was favourable to the occurrence of endemic malaria. Some support is lent to this view by reason of the fact that the spleen-rate of Kangra district has not only remained constant but it has also remained *uniformly* higher during the past ten years than that of any other district.

It may therefore be concluded that rice cultivation appears to be in some measures conducive to *endemic malaria*, but it is necessary to regard this conclusion as being purely tentative since malaria surveys have shown that rice cultivation in the vicinity of towns is not always associated with a spleen rate of appreciable proportions. In these circumstances it is held that it is not the cultivation of rice alone but rather circumstances associated therewith which supplies the environmental conditions favourable to endemic malaria. In other words it would appear (and there are other grounds for this statement) that no direct or constant relationship exists between the local facilities for the multiplication of mosquitoes—and indeed the local prevalence of "carriers"—and the local incidence of endemic malaria. The conclusion is in fact irresistible that many factors are concerned in the mechanism of endemic malaria and that the anopheline factor, although an important and essential factor, is incapable, in the absence of other essential factors of determining the local incidence of endemic malaria.

It is not possible to state whether malaria existed previous to the cultivation of rice since the area under rice has not materially changed since the introduction of statistical returns. It is likewise impossible to state that rice cultivation near towns has led to a local increased in endemic malaria, but it may be surmised, for reasons already given, that, other factors being favourable, it does sometimes lead to an increase in the local incidence of the disease.

Finally, it can be stated with more certainty that rice cultivation is associated with no peculiar clinical type of malaria. No association can in fact be traced between rice cultivation and severe forms of malaria (bilious remittent, algid, comatose, etc.) which in this province are rarely encountered except during epidemics. On the other hand rice cultivation is mainly associated with endemic malaria which exhibits itself in this province as a chronic disease associated with anæmia and enlargement of the spleen and with little or no *direct* mortality.

4. Measures taken to combat malaria; results obtained by their employment?

The part played by rice cultivation in favouring malaria in the Punjab does not appear to warrant drastic action to prevent the cultivation of rice in the vicinity of human habitations. It is felt that no conclusion of universal application can in the present state of knowledge properly be reached and that the local circumstances affecting individual localities require investigation before the part played by rice cultivation in favouring endemic malaria can be correctly appraised. It is necessary to emphasise the point that these investigations require to be conducted by a malariologist and not merely by an entomologist, for it is considered that many of the epidemiological investigations carried out during recent years are open to the criticism that they have been concerned more with the study of mosquitoes than with malaria.

5. Legislative rules and regulations and publication dealing with the subject?

There are no recent local publications dealing with the subject and the only legislative rules are those contained in the Punjab Municipal Act (Section 120) which states that if the Medical Officer of Health of any Municipal town is of opinion that the cultivation of any description of crop is injurious to the health of the neighbourhood, the Local Government may, by notification, prohibit the cultivation of the crop. This provision has however been sparingly used and even more sparingly enforced, but rice cultivation has been prohibited within the boundaries of the cities of Lahore and Amritsar and of the towns of Muzaffargarh, Dera Ghazi Khan and Shahabad.

APPENDIX E.

Copy of Memorandum regarding the Epidemiology of Pneumonic Plague prepared by Lieut-Col. C. A. Gill, I.M.S., D.P.H., Offg. Director of Public Health, Punjab, under the orders of the Director-General, Indian Medical Service, for submission to the Office International d'Hygiene Publique Paris.

(*a*) The Extent to which Pneumonic Plague is prevalent in your Province ?

Primary pneumonic plague is not common in the Punjab : it constitutes probably less than 5 per cent. of the total plague mortality. Nevertheless it possesses an importance out of all proportion to its incidence by reason of the fact that it constitutes the starting point of many outbreaks of *bubonic* plague. Before explaining this circumstance it is necessary to detail briefly the main epidemiological features exhibited by pneumonic plague in the Punjab.

In the first place it exhibits a *distinctive geographical* distribution being mainly encountered in the districts in the extreme north of the Province—though scattered small outbreaks do occur in almost all districts in the Province. In Jhelum district in the north of the Punjab 9 out of 56 villages (16 per cent.) were infected with pneumonic plague in 1907.

Secondly it exhibits a *distinctive seasonal prevalence* since it occurs solely during the coldest months of the year (December, January, February) whilst outbreaks of bubonic plague reach their maximum intensity during the spring (March-April). Again, it is not usually preceded or accompanied by *rat mortality* as invariably occurs in the case of bubonic plague. It will, however, be mentioned later that rat mortality is sometimes detected prior to the occurrence of the first case of *indigenous* pneumonic plague.

Finally, the *dispersive power* of pneumonic plague, though far greater and more rapid than in the case of bubonic plague would not appear to be so great as in Manchuria. On the other hand the dispersive power of pneumonic plague is greater in the north of the province than in the southern districts and greater at the height of winter than during the spring.

(*b*) Do epidemics of pneumonic plague occur without admixture with bubonic ?

Primary pneumonic plague frequently occurs during the height of winter without admixture with bubonic plague and without the occurrence of *detected* rat mortality. As the season advances both forms of plague may occur together in the same village, whilst later, as the weather gets warmer, pneumonic plague ceases and the bubonic form is *solely* encountered. It has been frequently observed that the importation of a case of pneumonic plague is followed, first by human cases amongst contacts and later by *rat mortality*, and then, after an interval of one or two weeks, by an outbreak of bubonic plague. It is on account of this observation that the assertion is made that pneumonic plague in the Punjab possesses an importance out of proportion to its incidence. To quote an instance, five villages were infected by a human case of peumonic plague with the result that 27 persons contracted the disease and died, whilst in two of these villages an outbreak of bubonic plague, which caused the death of 54 persons, subsequently occurred. (The magnitude of these outbreaks was probably much reduced owing to the prompt adoption of preventive measures).

(*c*) Can a bubonic case develop a pneumonic case with infected sputum ?

The precise meaning of this question is not clear, but the writer has never observed or heard of a case of bubonic plague assuming the characteristics of primary pneumonic plague nor is there on record any instance of an outbreak of primary pneumonic plague occurring amongst those in contact with a bubonic case in which a secondary pneumonia has developed. There is indeed no reason to believe that a secondary plague pneumonia is related epidemiologically to primary pneumonic plague, whilst clinically these two forms of disease are so distinctive as to be readily differentiated. (The sputum in secondary pneumonic plague has not however been examined by the writer).

The origin of outbreaks of primary pneumonic plague (when not due to direct importation by a man during the incubation period or in the initial stages of pneumonic plague) is often obscure, but it is, at any rate sometimes, associated with an antecedent rat mortality. In many cases, however, the first indigenous case of primary pneumonic plague occurs in the absence of any history of rat mortality It may be that infection in these cases has spread directly (aerially) from the rat to man. This is an inference, but that infection may spread direct from man to the rat in the case of pneumonic plague rests upon direct observation. The writer thus followed an individual who had fled from a house in which pneumonic plague was present to a village in which plague (in any form) had never previously occurred. On arrival at the village three days later he found that the man was suffering from pneumonic plague and that dead rats were present in the room which he occupied. (Other cases of *pneumonic plague* subsequently occurred in the same *house* and a few weeks later, following a well marked rat epizootic, *bubonic plague* broke out in the village for the first time in its history).

(*d*) Is there any evidence of symbiosis of plague and influenza ?

The writer has examined this hypothesis in a review (published in the Transactions of the Royal Society of Tropical Medicine and Hygiene) of Dr. Norman White's Report to the Health Committee of the League of Nations on his visit to the Far East. There is nothing to add to the remarks there made, and it will suffice to state that not only does there appear to be no substantial ground for the belief that influenza and pneumonic plague are in any way related, but there is some reason to think that the distinctive epidemiological and clinical features presented by pneumonic and bubonic plague are adequately explained in terms of existing knowledge regarding the nature of the circumstances favouring or determining the transmission of *B. pestis* by a direct (aerial) route and by the indirect agency of the rat-flea. It may be added that the writer's epidemiological observations were conducted between 1907—1912 and again in 1920-21, *i.e.*, before and after the great influenza epidemic in 1918, and it is possible to state that the epidemiology of pneumonic plague exhibited precisely similar characters during both these periods.

APPENDIX F.

The Longevity Index.

As it is impossible, owing to the unreliable nature of Indian statistics, to determine the relative salubrity of communities by means of constructing life tables, an endeavour has been made to appraise the influence of environmental conditions upon the inhabitants of the districts of the Punjab by means of calculating the number of persons of and over 60 years of age per 10,000 of the population in each district of the Punjab as given in the census report for the year 1921. It is proposed to call this figure the longevity index. The district indices are shown in Table B and they are also depicted in the attached map.

TABLE B.

The Longevity Index of Districts.

	District.	Longevity Index.
Class I	Hoshiarpur	861
	Jullundur	859
	Jhelum	851
Class II	Kangra	776
	Sialkot	772
	Gujrat	756
	Amritsar	735
	Ludhiana	712
	Rawalpindi	706
Class III	Attock	689
	Jhang	686
	Gurdaspur	678
	Gujranwala	663
	Shahpur	652
	Sheikhupura	649
	Lahore	641
	Ambala	627
	Montgomery	619
	Ferozepore	608
	Lyallpur	604
Class IV	Mianwali	598
	Dera Ghazi Khan	562
	Multan	560
	Muzaffargarh	551
	Hissar	546
	Rohtak	518
	Gurgaon	511
	Simla	475
	Karnal	468

A scrutiny of this table shows that the longevity index in the different districts of the Province varies as from high as 861 in Hoshiarpur District to as low as 468 in Karnal District.

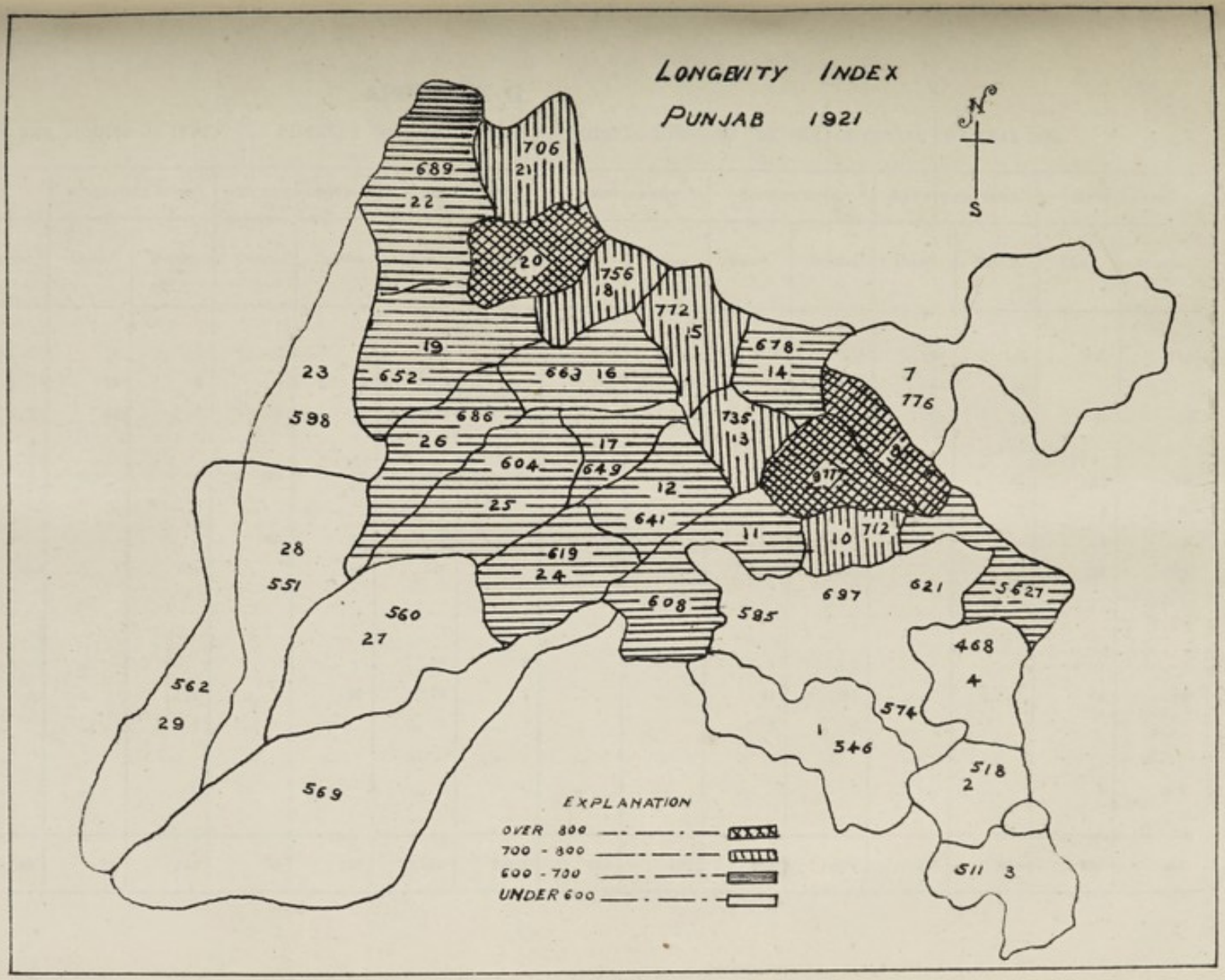
The districts can be divided into four classes in accordance with the height of their longevity indices. In class I, where the index is over 800, are the districts of Hoshiarpur, Jullundur and Jhelum. In class II, where the longevity index varies between 700 and 800, are the districts of Kangra, Sialkot, Gujrat, Amritsar, Ludhiana and Rawalpindi. Class III comprises eleven districts in which the longevity index varies between 600 and 700, whilst in class IV are nine districts in which the longevity index is under 600. By differential shading of the districts in accordance with their respective indices the striking result shown in the annexed map is obtained. It will be seen that districts belonging to class I and II where the longevity index is uniformly high are all submontane districts; that the districts belonging to class III comprise a solid block of districts in the centre of the Province, whilst the districts belonging to class IV are all located in the extreme south-east and south-west of the Province. After making allowance for the inaccurate recording of ages, for the possible effect of migration and, more especially, for the effect upon the age composition of the population of the withdrawal of men of military age from the main recruiting districts, there is still some reason to believe that the longevity index does in some measures express the influence of environmental conditions upon man.

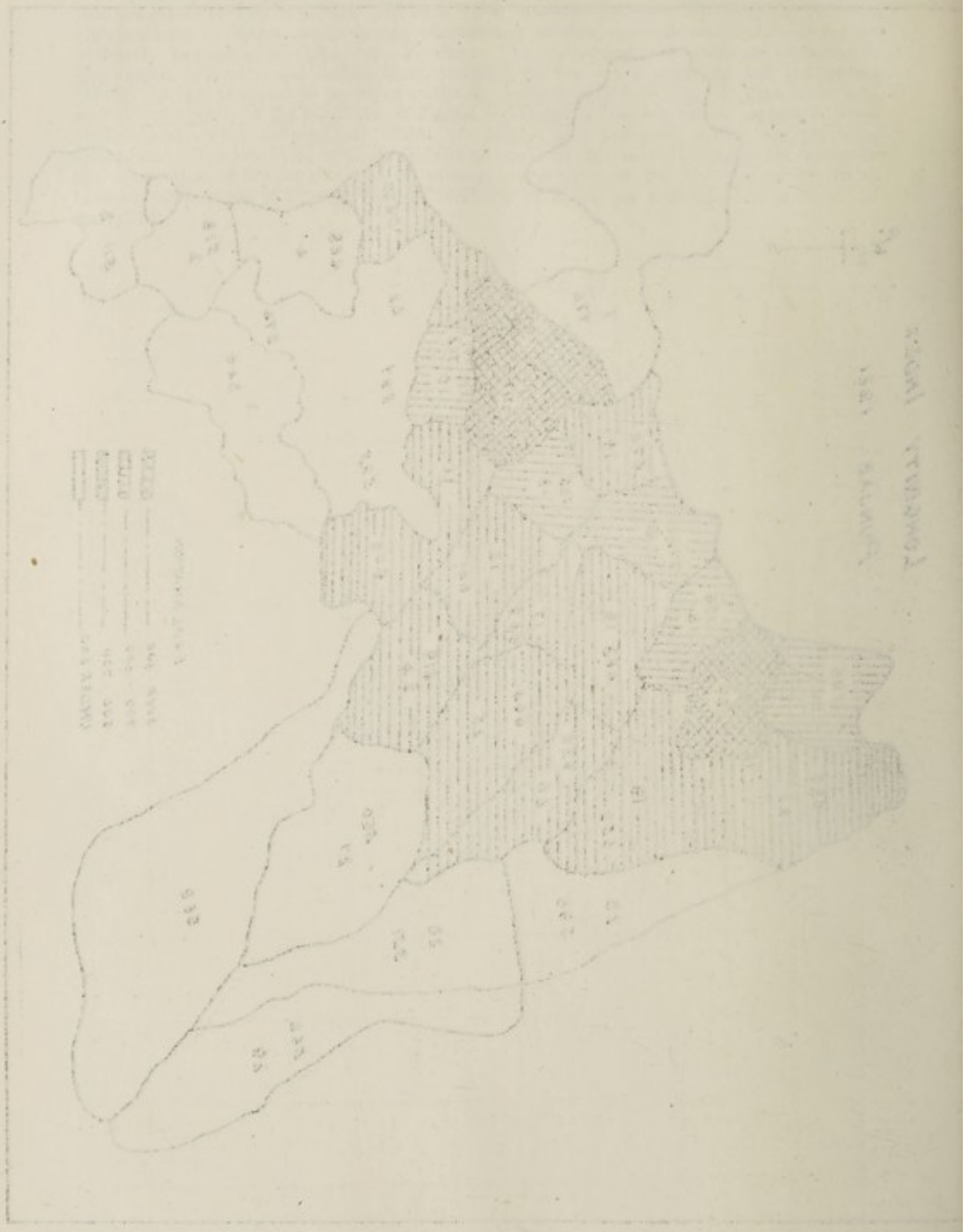
Assuming no difference in stamina arising out of racial characteristics, it would appear that the causes that go to shorten life, or in other words to produce a low longevity index—a high incidence of disease, unfavourable climatic and adverse economic conditions—do not act uniformly throughout all parts of the Province. The environmental conditions prevailing in Hoshiarpur, Jullundur, and Jhelum Districts during the ten years preceding the last census (1921) would thus appear to have been relatively more favourable to long life than elsewhere, whilst the longevity of the population of Karnal and Gurgaon Districts would appear to have been reduced owing to combined effect of famine and pestilence during the preceding decennium. The low index of Simla District possesses no significance owing to the abnormal age composition of the population at the summer head-quarters of the Government of India. It must not therefore be inferred that the residents of Simla are predestined to a short (if merry) life.

MAP OF PUNJAB.

DISTRICTS.

1. Hissar.
2. Rohtak.
3. Gurgaon.
4. Karnal.
5. Ambala.
6. Simla.
7. Kangra.
8. Hoshiarpur.
9. Jullundur.
10. Ludhiana.
11. Ferozepore.
12. Lahore.
13. Amritsar.
14. Gurdaspur.
15. Sialkot.
16. Gujranwala.
17. Sheikhupura.
18. Gujrat.
19. Shahpur.
20. Jhelum.
21. Rawalpindi.
22. Attock.
23. Mianwali.
24. Montgomery.
25. Lyallpur.
26. Jhang.
27. Multan.
28. Muzaffargarh.
29. Dera Ghazi Khan.





APPENDIX G.

STATEMENT SHOWING THE NUMBER OF INFECTIOUS DISEASES NOTIFIED IN EIGHT MUNICIPAL TOWNS OF THE PUNJAB DURING THE YEAR 1924.

Name of diseases.	Simla town.		Jullundur town.		Ludhiana town.		Lahore city.		Amritsar city.		Sialkot town.		Rawalpindi town.		Multan city.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Plague ...	...	...	8	4	2	2	3,072	1,764	268	154	213	179	233	143	500	152
Cholera ...	...	...	13	8	2	2	163	132	175	150	26	20	44	30	...	...
Smallpox ...	17	3	44	22	8	8	119	44	...	205	4	4	29	24	75	39
Influenza ...	76	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles ...	192	3	...	83	13	13	171	88	...	93	173	173	47	46	91	86
Chicken-pox ...	42	...	1	5	...	...	14	...	...	...	...	...	1	1	1	1
Diphtheria ...	4	..	..	...	45	14	6	...	...	8	...	...	...	...	2	2
Tubercle of lungs ...	8	69	...	104	..	128	516	...	...	382	163	163	...	...	125	122
Scarlet fever ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Typhus fever ...	...	...	...	...	..	..	6	...	...	...	...	...	...	...	...	...
Erysipelas ...	2	...	...	...	..	...	10	2	...	...	1	1	...	...	...	...
Enteric fever ...	12	4	...	12	...	90	76	2	...	...	31	31	...	...	44	23
Mumps ...	15	...	...	5	...	..	...	...	..	...	3	3	...	...	...	...
Relapsing fever ...	...	...	..	...	...	...	...	..	...	...	...	...	...	...	...	...
Whooping Cough ...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	1	1
Total ...	368	84	66	244	70	257	4,154	2,032	443	989	644	574	354	244	839	446

APPENDIX H.

Statement showing the death-rates from Cholera, Smallpox, Fevers and Dysentery and Diarrhœa for the five years preceding and for the period since the introduction of drainage or water-supply or both in the under-mentioned towns.

Towns.	Date of completion of works of		Average annual death-rate since the introduction of drainage or water-supply or both.				Average annual death-rate for the five years period preceding the introduction of drainage or water-supply or both.				Remarks.
	Drainage.	Water-supply.	Cholera.	Smallpox.	Fevers.	Dysentery and Diarrhœa.	Cholera.	Smallpox.	Fevers.	Dysentery and Diarrhœa.	
1	2	3	4	5	6	7	8	9	10	11	12
Rohtak	1923	...	...	0·1	15·4	1·0	0·5	0·3	27·7	1·2	
Ambala	...	1895	0·5	0·4	13·0	3·1	0·5	0·4	19·3	6·4	
Simla	1893	1893	0·02	0·3	13·7	1·0	...	1·1	17·1	1·4	
Dharmsala	...	1908	0·6	0·04	9·3	1·9	0·3	...	6·1	1·6	
Ludhiana	1895	1909	0·3	0·6	17·4	1·1	0·4	2·7	20·8	1·6	
Jagraon	1907	...	0·5	1·1	13·4	1·6	0·6	1·5	9·3	2·0	
Ferozepore	1916	...	0·5	0·8	12·9	1·3	0·2	0·7	9·8	1·1	
Zira	1913	...	0·5	1·5	18·3	0·7	0·3	4·0	16·6	0·9	
Fazilka	1913	...	1·1	1·1	23·1	1·8	2·2	2·6	21·4	1·7	
Lahore	1921	1881	0·3	0·5	16·5	1·7	0·2	0·6	20·0	1·3	
Kasur	1922	...	1·6	0·1	14·0	1·4	1·6	1·0	21·8	1·0	
Amritsar	1885	1904	0·6	1·1	22·2	1·7	0·4	0·7	31·3	1·8	
Gurdaspur	1918	...	0·2	0·5	17·0	3·0	0·6	0·3	14·2	3·1	
Dalhousie	...	1894	0·04	0·04	11·6	1·7	...	...	9·6	2·4	
Pathankot	1915	...	1·2	0·5	19·3	3·1	0·8	0·7	12·4	2·8	
Sialkot	...	1915	0·6	0·2	12·9	2·2	3·0	1·2	9·6	2·3	
Gujranwala	1892	...	0·6	0·9	18·5	1·2	0·5	0·6	19·7	1·7	
Gujrat	1906	...	0·9	0·3	19·4	1·8	0·3	0·2	16·9	1·9	
Bhera	1917	...	0·1	0·2	21·2	1·9	0·03	0·7	17·8	1·7	
Sargodha	1907	1907	0·004	0·3	7·5	0·7	Not available.				
Jhelum	1908	...	0·2	0·5	13·7	1·7	1·5	0·3	14·0	2·1	
Pind Dadan Khan ...	1909	1909	0·1	1·3	20·3	2·7	1·1	0·7	23·1	3·6	
Rawalpindi	1907	1887	0·6	0·3	18·5	2·3	0·5	0·1	16·4	3·4	
Murree	...	1894	0·1	0·1	15·0	1·9	0·7	0·4	14·8	0·9	
Mianwali	...	1904	0·2	0·5	19·5	1·9	Not available.				
Lyallpur	1904	1904	0·1	0·6	10·7	0·7	*2·8	*0·4	*16·3	*2·1	
Gojra	...	1916	0·2	0·4	7·4	0·7	†...	†...	†0·5	†...	
Multan	1907	...	0·2	0·8	18·1	2·3	0·01	1·9	16·9	2·4	
Shujabad	1922	...	0·1	0·4	19·9	1·3	0·7	1·1	31·1	2·9	
Dera Ghazi Khan ...	...	1913	0·04	0·4	15·7	2·2	2·0	0·6	15·9	1·6	
Kalka		1890	0·3	0·1	14·2	2·2	1·7	0·2	15·2	3·9	

* Figures available for four years only.
† Figures for 1914 and 1915 only.

1 D of P H —35)—21-7-15—33 PP Lahore.

ANNUAL FORM No. I.

STATEMENT SHOWING THE BIRTHS REGISTERED IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924.

2	3			4			5			6	7	8	9			10
Districts.	Population according to Census of 1921.*			Number of births Registered.			Ratio of births per 1,000 of population.			Number of males born to every 100 females born.	Excess of births over deaths per 1,000 of population.	Excess of deaths over births per 1,000 of population.	Mean Ratio of births per 1,000 during previous five years.			Number.
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.				Males.	Females.	Total.	
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
AMBALA DIVISION.																
isar ...	435,562	381,248	816,810	17,528	15,400	32,928	21·5	18·9	40·3	113·8	7·6	...	20·9	18·8	39·8	1
htak ...	417,379	354,893	772,272	16,880	15,151	32,031	21·9	19·6	41·5	111·4	...	33·0	23·0	21·0	44·0	2
rgaon ...	367,800	314,203	682,003	17,771	16,045	33,816	26·1	23·5	49·6	110·8	16·6	...	24·1	21·7	45·7	3
rnal ...	453,637	375,089	828,726	16,885	14,969	31,854	20·4	18·1	38·4	112·8	...	8·0	21·5	19·1	40·6	4
mbala ...	360,967	280,942	641,909	13,176	11,743	24,919	20·5	18·3	38·8	112·2	3·6	...	20·2	18·2	38·5	5
mla ...	27,599	13,338	40,937	553	505	1,058	13·5	12·3	25·8	109·5	6·3	..	10·9	9·5	20·4	6
JULLUNDUR DIVISION.																
ngra ...	393,121	371,626	764,747	14,494	13,554	28,048	19·0	17·7	36·7	106·9	1·7	...	18·1	16·7	34·8	7
shiarpur ...	498,662	428,757	927,419	21,539	19,053	40,592	23·2	20·5	43·8	113·0	11·9	...	21·9	19·6	41·5	8
llundur ...	450,045	363,480	813,525	13,848	17,383	36,231	23·2	21·4	44·5	108·4	14·2	...	22·3	20·8	43·0	9
thiana ...	318,845	248,777	567,622	12,547	11,426	23,973	22·1	20·1	42·2	109·8	10·3	...	22·1	20·4	42·6	10
rozepore ...	598,760	480,547	1,079,307	21,179	17,108	38,287	19·6	15·9	35·5	123·8	4·5	...	19·9	17·6	37·5	11
LAHORE DIVISION.																
hore ...	636,596	480,134	1,116,730	21,479	19,113	40,592	19·2	17·1	36·3	112·4	...	14·6	21·6	19·3	40·9	12
ritsar ...	518,500	409,898	928,398	21,681	19,841	41,522	23·4	21·4	44·7	109·3	2·7	..	24·4	22·2	46·6	13
rdaspur ...	467,576	380,238	847,814	19,147	17,839	36,986	22·6	21·0	43·6	107·3	4·7	...	23·4	21·4	44·8	14
alkot ...	472,231	396,703	868,934	18,561	16,804	35,365	21·4	19·3	40·7	110·5	...	24·4	23·1	21·4	44·8	15
jranwala ...	348,695	274,886	623,581	12,732	11,351	24,083	20·4	18·2	38·6	112·2	...	28·6	22·6	20·1	42·7	16
ikhupura ...	351,259	277,163	628,422	11,698	10,076	21,774	18·6	16·0	34·6	116·1	...	17·8	19·5	17·0	36·5	17
AWALPINDI DIVISION.																
jrat ...	438,550	385,496	824,046	15,569	13,617	29,186	18·9	16·5	35·4	114·3	...	66·7	19·8	17·8	37·6	18
hapur ...	392,086	327,832	719,918	14,666	12,870	27,536	20·4	17·9	38·2	114·0	...	0·3	19·5	17·1	36·7	19
elum ...	240,464	235,104	475,568	9,321	7,984	17,305	19·6	16·8	36·4	116·7	...	11·3	19·4	16·9	36·3	20
walpindi ...	292,317	248,376	540,693	10,599	9,737	20,336	19·5	18·0	37·6	108·9	...	0·5	19·1	17·3	36·4	21
tock ...	262,028	246,001	508,029	10,156	8,453	18,609	20·0	16·6	36·6	120·1	0·7	...	19·1	16·4	35·5	22
anwali ...	190,021	168,184	358,205	8,121	7,261	15,382	22·7	20·3	42·9	111·8	8·3	...	22·1	19·6	41·7	23
MULTAN DIVISION.																
ntgomery ...	393,372	320,414	713,786	16,522	14,146	30,668	23·1	19·8	43·0	116·8	7·8	...	21·1	18·1	39·2	24
yallpur ...	522,707	413,235	935,942	22,651	20,147	42,798	24·2	21·5	45·7	112·4	10·2	...	25·2	22·8	48·0	25
ang ...	305,483	265,076	570,559	12,903	11,436	24,339	22·6	20·0	42·7	112·8	6·2	...	22·6	20·2	42·8	26
ultan ...	484,581	399,593	884,174	20,249	17,509	37,758	22·9	19·8	42·7	115·6	10·6	...	21·5	18·6	40·1	27
uzaffargarh ...	308,605	259,873	568,478	10,599	8,915	19,514	18·6	15·7	34·3	118·9	2·7	...	18·0	15·1	33·0	28
era Ghazi Khan	257,386	211,666	469,052	7,711	6,484	14,195	16·4	13·8	30·3	118·9	...	9·8	17·1	13·7	30·8	29
Total ...	11,204,834	9,312,772	20,517,606	435,765	385,920	821,685	21·2	18·8	40·1	112·9	...	3·3	21·4	19·1	40·5	

*Excluding population of military cantonments.

ANNUAL FORM

STATEMENT OF BIRTHS AND DEATHS REGISTERED IN EACH

1	2	3	4	5			6		7		
Number.	Districts.	Area in square miles.	Average population per square mile.	Population (Census 1921).			Births.		Number of deaths Registered.		
				Males.	Females.	Total.	Total number.	Birth-rate per 1,000 of population.	Males.	Females.	Total.
1	2	3	4	5	6	7	8	9	10	11	12
	AMBALA DIVISION.										
1	Hissar	5,213	157	435,562	381,248	816,810	32,928	40·3	13,241	13,478	26,719
2	Rohtak	2,919	265	417,379	354,893	772,272	32,031	41·5	29 583	27,955	57,538
3	Gurgaon	2,263	301	367,800	314,203	682,003	33,816	49·6	11,640	10,869	22,509
4	Karnal	3,125	265	453,637	375,089	828,726	31,854	38·4	20,175	18,240	38,415
5	Ambala	1,882	341	360,967	280,942	641,909	24,919	38·8	12,020	10,544	22,564
6	Simla	101	405	27,599	13,338	40,937	1,058	25·8	461	333	797
	JULLUNDUR DIVISION.										
7	Kangra... ...	2,978	77	393,121	371,626	764,747	28,048	36·7	13,964	12,803	26,767
8	Hoshiarpur ...	2,247	413	498,662	428,757	927,419	40,592	43·8	15,642	13,914	29,556
9	Jullundur ...	1,431	568	450,045	363,480	813,525	36,231	44·5	12,797	11,856	24,653
10	Ludhiana ...	1,452	391	318,845	248,777	567,622	23,973	42·2	9,316	8,444	17,760
11	Ferozepore ...	4,286	252	598,760	480,547	1,079,307	38,287	35·5	17,484	15,948	33,432
	LAHORE DIVISION.										
12	Lahore	2,691	415	636,596	483,134	1,116,730	40,592	36·3	29,412	27,428	56,840
13	Amritsar... ...	1,593	583	518,500	409,698	928,398	41,522	44·7	20,039	18,987	39,026
14	Gurdaspur ...	1,889	449	467,576	380,238	847,814	36,986	43·6	17,057	15,882	32,939
15	Sialkot	1,206	721	472,231	396,703	868,934	35,365	40·7	27,639	28,893	56,532
16	Gujranwala ...	2,309	270	348,695	274,886	623,581	24,083	38·6	21,222	20,681	41,903
17	Sheikhupura ...	3,198	197	351,259	277,163	623,422	21,774	34·6	16,943	15,938	32,941
	RAWALPINDI DIVISION.										
18	Gujrat	2,563	322	438,550	385,486	824,046	29,186	35·4	41,337	42,769	84,136
19	Shahpur	4,476	161	392,086	327,832	719,918	27,536	38·2	14,264	13,461	27,725
20	Jhelum	2,773	172	240,464	235,104	475,568	17,905	36·4	11,281	11,418	22,699
21	Rawalpindi ...	2,023	267	292,817	248,376	540,693	20,336	37·6	10,121	10,090	20,211
22	Attock	4,117	123	262,028	246,001	508,029	18,609	36·6	9,484	8,741	18,225
23	Mianwali	5,395	66	190,021	168,184	358,205	15,382	42·9	6,512	5,880	12,392
	MULTAN DIVISION.										
24	Montgomery ...	4,623	154	393,372	320,414	713,786	30,968	43·0	13,275	11,850	25,125
25	Lyallpur	2,759	339	522,707	413,235	935,942	42,798	45·7	16,843	16,424	33,267
26	Jhang	3,452	168	305,483	265,076	570,559	24,339	42·7	10,837	9,991	20,828
27	Multan	5,939	149	484,581	399,593	884,174	37,758	42·7	14,727	13,617	28,344
28	Muzaffargarh ...	6,052	94	308,605	259,873	568,478	19,514	34·3	9,561	8,412	17,973
29	Dera Ghazi Khan ...	5,325	88	257,886	211,666	469,052	14,195	30·3	10,451	8,359	18,810
	Total ...	97,280	211	11,904,834	9,312,772	20,517,606	821,685	40·1	457,788	453,238	891,026

Note.—Those born dead are not include

No. II.

DISTRICT OF THE PUNJAB DURING THE YEAR 1924.

8	9											10			11
	Deaths per 1,000 of population from											Mean ratio of deaths per 1,000 during previous five years.			
Number of deaths of males to every 100 deaths of females.	Cholera.	Smallpox.	Plague.	Fevers	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	*All causes.* Males.	*All causes.* Females.	*All causes.* Total.	Males.	Females.	Total.	Number.
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
98·2	...	0·2	1·5	23·8	0·3	1·0	0·4	5·4	30·4	35·4	32·7	28·2	29·1	28·6	1
105·8	...	0·1	43·6	22·8	0·3	1·8	0·3	5·7	70·9	78·8	74·5	28·7	29·7	29·2	2
107·1	0·01	0·2	4·6	16·1	0·5	1·7	0·5	9·3	31·7	34·6	33·0	31·9	33·5	32·6	3
110·6	0·01	0·03	9·9	29·6	0·2	1·2	0·3	5·2	44·5	48·6	46·4	37·1	39·2	38·0	4
114·0	0·1	0·03	0·1	15·4	0·5	13·2	...	5·9	33·3	37·5	35·2	33·3	36·9	34·9	5
137·2	...	...	...	12·9	1·1	1·0	...	4·5	16·7	25·2	19·5	25·3	32·8	27·8	6
109·1	0·04	0·04	0·01	18·1	3·4	4·7	0·8	8·0	35·5	34·5	35·0	36·7	36·5	36·6	7
112·4	0·02	0·6	0·1	24·2	0·01	2·4	0·2	4·4	31·4	32·5	31·9	27·7	28·1	27·8	8
107·9	0·03	0·4	0·3	21·3	0·5	2·1	0·3	5·5	28·4	32·6	30·3	24·2	27·5	25·7	9
110·3	0·1	0·3	0·4	18·9	0·6	2·5	0·2	8·4	29·2	33·9	31·3	24·3	29·4	26·7	10
109·6	0·2	0·1	1·8	21·0	0·5	1·1	0·3	6·1	29·2	33·2	31·0	23·9	25·9	24·8	11
107·2	1·3	0·2	18·9	19·4	0·8	3·5	0·4	6·3	46·2	57·1	50·9	24·3	27·7	25·8	12
105·5	0·2	0·5	5·8	24·9	1·0	4·3	0·3	5·0	38·7	46·3	42·0	26·9	29·7	28·1	13
107·4	0·1	0·2	3·9	20·9	1·2	10·6	0·02	1·9	36·5	41·8	38·9	28·1	29·0	28·5	14
95·7	0·5	0·2	34·1	20·3	0·8	2·3	0·3	6·0	58·5	72·8	65·1	30·5	33·7	32·0	15
102·6	0·1	0·1	35·6	23·3	0·7	2·3	0·4	4·8	60·9	75·2	67·2	26·3	28·5	27·3	16
105·9	0·01	0·2	28·6	18·2	0·5	0·5	0·2	4·4	48·2	57·7	52·4	18·9	19·7	19·2	17
96·7	0·1	0·1	79·2	15·4	0·3	2·5	0·2	4·4	94·3	111·0	102·1	24·9	24·9	24·9	18
105·0	0·1	0·2	14·1	17·5	0·3	0·2	0·3	6·0	36·4	41·1	38·5	21·9	22·2	22·0	19
98·8	0·002	0·6	18·5	19·6	0·4	2·9	0·4	5·3	46·9	48·6	47·7	30·9	29·0	30·0	20
104·3	0·1	0·1	5·4	21·1	1·0	4·0	0·4	6·0	36·0	40·6	38·1	30·6	32·3	31·4	21
108·5	0·01	0·2	7·3	23·7	0·1	1·4	0·4	2·9	36·2	35·5	35·9	27·2	25·9	26·6	22
110·7	...	0·02	0·01	29·7	0·4	0·8	0·3	3·4	34·3	35·0	34·6	26·7	26·9	26·8	23
112·0	0·3	0·4	6·5	23·7	0·1	0·5	0·5	3·3	33·8	37·0	35·2	19·5	20·3	19·9	24
102·6	0·4	0·3	6·9	20·9	0·2	1·0	0·3	5·6	32·2	39·7	35·5	20·9	23·9	22·2	25
108·5	0·04	0·1	1·2	25·0	0·6	2·2	0·4	7·1	35·5	37·7	36·5	22·0	22·4	22·2	26
108·2	0·01	0·1	0·4	25·3	0·2	1·1	0·4	4·5	30·4	34·1	32·1	21·8	23·2	22·4	27
113·7	0·003	0·1	0·003	28·9	0·1	0·3	0·5	1·8	31·0	32·4	31·6	28·0	27·6	27·8	28
125·0	...	0·01	0·02	37·2	0·3	0·7	0·3	1·6	40·6	39·5	40·1	24·8	24·0	24·4	29
105·7	0·2	0·2	12·2	22·0	0·6	2·7	0·3	5·2	40·9	46·5	43·4	26·6	28·2	27·4	

in this or any other statement.

ANNUAL FORM No. III.

DEATHS REGISTERED IN THE DISTRICTS OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

Serial No.	Districts.	3												4
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total deaths registered during the year.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	AMBALA DIVISION.													
1	Hissar ...	2,298	1,959	2,195	2,835	2,943	2,765	2,064	1,525	1,743	2,070	2,113	2,209	26,719
2	Rohtak ...	4,212	6,624	14,134	13,792	5,597	2,583	1,557	1,222	1,893	1,820	2,034	2,570	57,588
3	Gurgaon ...	1,450	1,530	2,014	2,132	1,858	2,016	1,451	1,220	1,750	2,356	2,193	2,539	22,509
4	Karnal ...	3,080	3,272	4,094	4,812	4,364	3,376	2,317	1,690	2,086	2,918	3,084	3,322	38,415
5	Ambala ...	1,546	1,428	1,499	1,472	1,641	2,013	1,776	1,412	2,150	2,985	2,549	2,093	22,564
6	Simla ...	53	51	56	78	68	77	94	73	70	56	63	58	797
	JULLUNDUR DIVISION.													
7	Kangra ...	1,517	1,597	1,887	2,116	2,760	2,588	2,237	2,019	2,911	3,021	2,141	1,973	26,767
8	Hoshiarpur ...	1,990	1,716	1,905	2,331	2,856	2,584	2,268	2,054	3,235	3,415	2,754	2,448	29,556
9	Jullundur ...	2,109	1,553	1,552	1,853	2,330	1,957	1,883	1,750	2,311	2,467	2,551	2,337	24,053
10	Ludhiana ...	1,626	1,213	1,163	1,213	1,530	1,564	1,371	1,239	1,798	1,780	1,717	1,546	17,760
11	Ferozepore ...	2,864	2,534	2,343	2,990	3,580	2,856	2,510	1,949	2,396	3,034	3,151	3,225	33,432
	LAHORE DIVISION.													
12	Lahore ...	3,647	3,376	6,564	11,312	7,824	3,946	3,080	2,941	3,452	3,328	3,701	3,669	56,840
13	Amritsar ...	2,220	1,830	3,374	4,159	4,797	3,123	2,542	2,427	3,591	4,051	4,262	3,650	39,026
14	Gurdaspur ...	1,692	1,478	1,876	3,101	3,152	2,049	1,870	1,992	4,167	4,822	3,828	2,912	32,939
15	Sialkot ...	2,926	3,843	8,911	13,034	8,455	3,008	1,608	1,623	2,975	3,620	3,633	2,896	56,532
16	Gujranwala ...	2,804	2,979	6,552	10,176	5,732	2,985	1,292	1,194	1,217	2,241	2,187	2,544	41,903
17	Sheikhupura ...	1,525	2,006	4,330	6,175	7,725	2,274	1,318	1,042	937	1,739	1,902	1,998	32,941
	RAWALPINDI DIVISION.													
18	Gujrat ...	3,016	3,492	10,984	21,027	20,333	11,138	5,444	1,091	1,473	2,022	2,057	2,059	84,136
19	Shahpur ...	2,073	2,227	3,497	4,725	3,748	2,187	1,179	908	1,032	1,573	2,097	2,459	27,725
20	Jhelum ...	1,841	1,680	2,381	4,102	4,357	1,715	769	769	866	1,185	1,481	1,553	22,499
21	Rawalpindi ...	2,550	1,811	1,681	2,010	2,241	1,843	1,039	942	1,203	1,634	1,769	1,888	20,611
22	Attock ...	1,952	1,616	1,600	1,755	2,348	1,796	939	743	846	1,237	1,592	1,801	18,225
23	Mianwali ...	1,074	927	767	651	739	749	712	682	803	1,745	1,643	1,900	12,392
	MULTAN DIVISION.													
24	Montgomery ...	2,941	2,267	2,358	2,035	2,983	1,833	1,463	1,505	1,416	1,701	2,163	2,460	25,125
25	Lyallpur ...	2,056	1,894	2,641	4,724	4,651	2,925	2,375	1,825	1,956	2,226	3,119	2,875	33,267
26	Jhang ...	2,090	1,491	1,438	1,378	1,797	1,520	1,279	1,046	1,119	1,857	2,649	3,164	20,828
27	Multan ...	2,973	2,188	1,709	1,879	2,148	1,819	1,847	1,404	1,447	2,536	4,038	4,356	28,344
28	Muzaffargarh...	1,697	1,307	1,195	1,104	1,431	1,446	1,096	670	865	1,875	2,823	2,464	17,973
29	Dera Ghazi Khan	2,040	1,647	1,808	1,919	1,984	1,694	1,080	564	572	1,379	2,198	1,925	18,810
	Total for the Province.	63,862	61,536	95,478	130,89	115,972	72,429	50,460	39,521	51,800	66,693	71,492	70,893	891,026
	Ratio of deaths per 1,000 in each month.	3·11	3·00	4·65	6·38	5·65	3·53	2·46	1·93	2·52	3·25	3·48	3·46	43·43

ANNUAL FORM No. IV.

DEATHS REGISTERED BY SEXES AND CLASSES ACCORDING TO SPECIFIED AGE PERIODS IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924.

ANNUAL FOR

DEATHS REGISTERED BY SEXES AND CLASSES ACCORDING TO SPECIFIED A

1	2	3									
		Population according to the census of 1921.									
No.	Districts.	*Muhammadans.*		*Hindus.*		*Indian Christians.*		*Other classes.*		*Total.*	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1	2	3	4	5	6	7	8	9	10	11	12
1	Hissar	112,889	103,054	322,126	277,714	486	431	61	49	435,562	381,
2	Rohtak	65,488	59,547	346,666	290,538	5,188	4,798	37	10	417,379	354,
3	Gurgaon	115,933	100,927	251,172	212,648	609	564	86	64	367,800	314,
4	Karnal	126,916	108,702	324,923	264,803	1,784	1,568	14	16	453,637	375,
5	Ambala	106,123	86,972	252,231	192,265	1,637	1,425	976	280	360,967	280,
6	Simla	4,611	1,244	21,433	10,205	487	329	1,068	1,560	27,599	13,
7	Kangra	21,025	17,210	370,380	352,749	142	142	1,574	1,525	393,121	371,
8	Hoshiarpur ...	155,165	134,133	341,419	292,957	1,982	1,657	96	10	498,662	428,
9	Jullundur ...	197,011	165,932	250,831	196,055	1 850	1,455	353	38	450,045	363,
10	Ludhiana ...	106,764	86,197	211,208	161,821	853	729	20	30	318,845	248,
11	Ferozepore ...	259,451	216,039	336,222	262,804	2,034	1,526	1,053	178	598,760	480,
12	Lahore	357,101	285,083	253,608	174,908	22,458	18,939	3,429	1,204	636,596	480,
13	Amritsar	232,747	190,653	278,793	213,423	6 590	5,636	370	186	518,500	409,
14	Gurdaspur ...	231,410	190,761	218,188	174,712	17,908	14,635	70	130	467,576	380,
15	Sialkot	288,815	246,325	153,436	125,740	28,670	24,491	1,310	147	472,231	396,
16	Gujranwala ...	246,243	196,904	87,253	65,869	15,141	12,050	58	63	348,695	274,
17	Sheikhupura ...	224,231	181,095	110,110	82,532	16,660	13,358	258	178	351,259	277,
18	Gujrat	377,925	331,759	59,348	52,641	1,242	1,046	35	50	438,550	385,
19	Shahpur	323,746	272,354	62,081	50,465	6,259	4,977	50	26	392,086	327,
20	Jhelum	212,844	209,447	27,415	25,528	199	125	6	4	240,464	235,
21	Rawalpindi ...	241,100	215,743	45,536	31,035	1,661	928	4,020	670	292,317	248,
22	Attock	238,983	224,507	22,741	21,411	115	56	189	27	262,028	246,
23	Mianwali... ...	162,581	146,295	27,153	21,807	123	28	164	54	190,021	168,
24	Montgomery ...	281,014	232,011	106,548	83,775	5,737	4,600	43	28	393,372	320,
25	Lyallpur	308,897	254,089	190,929	140,499	22,830	18,600	51	47	522,707	413,
26	Jhang	256,594	218,794	48,634	46,088	249	189	6	5	305,483	265,
27	Multan	396,651	332,194	84,408	65,264	2,341	1,999	1,181	136	484,581	399,
28	Muzaffargarh ...	268,374	224,995	39,951	34,802	72	68	208	8	308,605	259,
29	Dera Ghazi Khan ...	226,773	184,658	30,585	26,989	19	15	9	4	257,386	211,
	Total ...	6,147,435	5,217,624	4,875,328	3,952,047	165,276	136,364	16,795	6,737	11,204,834	9,312,
	Population according to Census of 1921.	...	...	...	...	...	...	...	...	...	...
	Ratio per 1,000 living for the Province.	...	...	...	...	...	...	...	...	...	...

. IV.

RIODS IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924.

4

UNDER ONE YEAR.

Not exceeding one month.								Over one month and not exceeding six months.								Number.
Muhammadans.		Hindus.		Indian Christians.		Other classes.		Muhammadans.		Hindus.		Indian Christians.		Other classes.		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1
431	442	1,050	671	...	...	...	...	325	300	546	390	...	...	...	...	1
601	311	1,180	1,201	5	1	...	...	307	105	560	670	2	1	...	...	2
278	282	703	642	...	...	...	...	300	327	651	489	...	...	...	...	3
563	576	892	677	...	...	...	...	673	478	783	766	1	1	...	...	4
387	337	975	899	...	...	...	...	255	177	693	743	...	...	...	...	5
1	...	1	1	...	...	...	...	1	...	1	1	...	...	...	...	6
95	80	1,594	1,373	...	...	...	...	65	73	933	819	...	1	...	...	7
601	525	1,353	1,123	2	3	...	...	423	327	762	761	2	1	...	...	8
1,076	969	1,313	1,347	...	...	...	...	291	304	412	436	...	...	...	...	9
475	357	623	618	2	1	...	...	205	301	578	482	2	1	...	...	10
824	762	893	658	2	...	...	...	617	528	531	510	1	1	...	...	11
1,776	1,589	381	320	12	11	...	...	1,133	905	221	225	14	17	...	...	12
995	859	974	856	5	1	...	1	798	611	589	610	8	1	1	...	13
1,108	828	979	861	115	105	9	6	479	506	487	401	52	50	1	4	14
1,084	945	560	448	133	105	47	38	719	661	388	339	92	85	34	32	15
951	830	211	187	55	49	17	12	917	881	141	151	37	34	11	8	16
596	512	211	201	48	41	21	19	492	474	222	165	47	25	24	26	17
1,152	964	97	73	1	5	2	1	1,030	930	91	60	3	3	1	1	18
1,157	93	169	152	14	15	...	...	629	562	62	56	10	6	...	...	19
705	562	70	41	...	...	...	...	434	400	41	38	...	1	...	...	20
900	743	144	112	1	1	1	1	500	448	86	76	...	...	...	...	21
946	743	36	31	...	...	...	...	361	370	24	28	...	...	...	...	22
488	341	58	61	...	...	1	...	387	226	46	48	...	...	...	...	23
1,160	862	319	370	36	20	2	1	592	419	140	212	18	16	2	3	24
1,226	1,045	899	737	69	42	20	8	724	380	293	463	28	70	20	...	25
1,394	1,299	195	227	...	...	...	...	754	638	161	176	1	...	...	...	26
1,821	1,513	283	287	12	9	1	1	776	737	370	303	18	10	...	...	27
699	574	178	115	...	...	...	...	745	655	128	106	...	...	...	...	28
657	450	140	81	...	...	1	3	608	486	112	87	...	...	2	2	29
24,148	20,234	16,492	14,370	512	409	122	91	15,540	13,189	10,052	9,611	336	324	96	76	
								Not available								
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

ANNUAL FORM

DEATHS REGISTERED BY SEXES AND CLASSES ACCORDING TO SPECIFIED AGE

1	2	4—concluded.															
		UNDER ONE YEAR—CONCLUDED.															
		OVER SIX MONTHS AND UNDER TWELVE MONTHS.								TOTAL UNDER ONE							
		Muhammadans.		*Hindus.*		*Indian Christians.*		*Other classes.*		*Muhammadans.*		*Hindus.*		*Indian Christians.*			
Number.	Districts.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.		
1	2	29	30	31	32	33	34	35	36	37	38	39	40	41	42		
1	Hisar	299	308	583	483	...	...	...	...	1,055	1,050	2,179	1,544	...	...		
2	Rohtak	103	99	754	664	4	2	...	...	1,012	515	2,494	2,535	11	4		
3	Gurgaon	369	285	602	560	1	1	...	...	947	894	1,956	1,691	1	1		
4	Karnal	373	299	465	350	...	...	...	...	1,609	1,353	2,140	1,793	1	1		
5	Ambala	139	129	529	439	...	...	...	...	781	643	2,197	2,081	...	...		
6	Simla	1	...	2	...	...	...	...	...	3	...	4	2	...	...		
7	Kangra	86	82	747	674	...	...	...	...	246	236	3,274	2,866	...	1		
8	Hoshiarpur ...	309	319	958	790	1	1	...	...	1,333	1,171	3,083	2,674	5	5		
9	Jullundur ...	424	343	562	535	...	...	...	...	1,791	1,616	2,287	2,318	...	...		
10	Ludhiana ...	338	218	395	459	1	2	...	...	1,018	876	1,598	1,559	5	4		
11	Ferozepore ...	584	573	546	513	...	2	...	...	2,025	1,863	1,970	1,681	3	3		
12	Lahore	1,196	1,043	235	202	19	20	...	...	4,107	3,537	837	747	45	48		
13	Amritsar	747	694	740	688	8	7	...	...	2,540	2,164	2,303	2,154	21	9		
14	Gurdaspur ...	667	619	632	530	70	62	7	2	2,254	1,953	2,088	1,792	237	217		
15	Sialkot	891	824	435	414	100	94	37	35	2,694	2,430	1,388	1,201	325	284		
16	Gujranwala ...	623	537	235	185	63	53	16	12	2,491	2,223	587	523	155	136		
17	Sheikhupura ...	596	431	199	188	48	64	24	28	1,684	1,417	632	554	143	130		
18	Gujrat	1,128	972	86	70	2	2	...	1	3,310	2,866	274	213	6	10		
19	Shahpur	1,154	1,115	159	142	25	15	...	...	2,940	2,611	390	330	49	36		
20	Jhelum	361	267	41	34	...	...	...	...	1,500	1,229	152	113	...	1		
21	Rawalpindi ...	335	345	86	73	...	...	...	...	1,735	1,536	316	261	1	1		
22	Attock	279	268	28	21	...	...	...	...	1,586	1,381	88	80	...	...		
23	Mianwali	259	305	45	44	...	...	...	...	1,134	872	149	153	...	...		
24	Montgomery ...	579	542	185	171	20	17	3	2	2,331	1,923	644	753	74	53		
25	Lyallpur	665	932	701	168	32	70	...	10	2,615	2,357	1,893	1,368	129	182		
26	Jhang	523	411	139	117	...	...	...	...	2,071	2,348	495	520	1	...		
27	Multan	1,080	1,048	76	80	7	2	1	2	3,677	3,298	728	670	37	21		
28	Muzaffargarh ...	466	536	67	73	...	...	...	...	1,910	1,765	373	294	...	...		
29	Dera Ghazi Khan ...	481	444	72	61	...	...	5	2	1,746	1,380	324	229	...	...		
	Total ...	15,057	13,989	10,294	8,718	401	414	93	94	54,745	47,412	36,838	32,699	1,249	1,147		
	Population according to Census of 1921.	Not available.								240,139	232,641	176,259	168,581	7,514	7,241		
	Ratio per 1,000 living for the Province.									227·97	203·80	209·00	193·97	166·22	158·40		

o. IV—CONTINUED.

ERIODS IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924—CONTINUED.

		5								6				
AR.		ONE YEAR AND UNDER FIVE YEARS.								FIVE YEARS AND UNDER TEN YEARS.				
Other classes.		Muhammadans.		Hindus.		Indian Christians.		Other Classes.		Muhammadans.		Hindus.		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Number.
43	44	45	46	47	48	49	50	51	52	53	54	55	56	1
...	...	1,071	1,101	1,879	1,840	...	...	...	...	342	461	847	874	1
...	...	897	717	2,017	3,184	5	7	...	..	913	701	2,123	2,308	2
...	...	392	368	888	831	...	...	...	...	220	249	493	460	3
...	...	1,204	1,058	1,094	1,035	...	...	...	...	108	172	704	558	4
...	...	512	597	1,531	1,431	...	...	...	...	163	101	333	356	5
...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	43	36	755	743	...	...	...	...	36	35	814	784	7
...	...	1,024	1,031	2,451	2,396	4	8	...	...	224	237	429	466	8
...	...	1,086	927	1,102	1,082	...	...	...	...	247	221	320	266	9
...	...	227	196	537	444	2	1	...	...	201	145	216	208	10
...	...	1,952	1,809	1,936	1,663	2	2	...	...	594	434	541	444	11
...	...	3,142	3,313	1,081	895	131	106	...	...	1,320	1,703	661	327	12
1	1	1,639	1,523	1,635	1,514	5	10	...	...	705	822	702	621	13
17	12	1,836	1,845	1,731	1,835	150	125	10	8	438	557	487	581	14
118	105	2,851	2,892	1,285	1,339	299	304	101	103	1,646	2,074	703	922	15
44	32	2,829	2,757	604	528	144	152	42	39	1,475	1,853	326	382	16
69	73	1,220	1,161	356	317	58	71	31	41	795	884	372	222	17
3	3	4,384	4,379	289	266	5	2	6	2	3,828	4,440	213	205	18
...	...	1,802	1,732	219	204	53	34	...	...	1,157	1,472	78	82	19
...	...	1,598	1,480	138	158	1	1	...	...	846	1,002	43	47	20
1	1	1,249	1,247	202	159	5	3	2	1	648	696	71	69	21
...	...	1,377	1,312	95	83	...	...	...	...	670	595	45	70	22
1	...	591	484	74	52	...	...	...	...	468	421	34	34	23
7	6	2,002	1,562	556	767	62	48	4	2	613	587	284	276	24
40	18	2,871	2,767	872	1,045	177	138	1	..	911	1,096	271	318	25
...	...	1,248	1,253	136	156	1	...	...	...	693	649	127	124	26
2	3	2,155	2,051	683	643	9	5	1	...	811	703	207	250	27
...	...	1,270	1,209	168	165	...	...	...	...	379	365	50	36	28
8	7	1,397	1,298	170	197	...	...	4	3	529	406	56	44	29
311	264	43,869	42,105	25,484	24,978	1,113	1,017	202	199	20,980	23,131	11,550	11,284	
52	20	587,475	566,315	430,242	408,415	18,176	17,236	167	98	950,073	831,383	683,426	592,470	
?	?	74·67	74·35	59·3	61·16	61·23	59·00	?	?	22·08	27·82	16·90	19·05	

DEATHS REGISTERED BY SEXES AND CLASSES ACCORDING TO SPECIFIED AG

1	2	6 - *concluded.*				7							
		FIVE YEARS AND UNDER TEN YEARS - *concluded.*				TEN YEARS AND UNDER FIFTEEN YEARS.							
		Indian Christians.		*Other classes.*		*Muhammadans.*		*Hindus.*		*Indian Christians.*		*Other classes.*	
Number.	Districts.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1	2	57	58	59	60	61	62	63	64	65	66	67	68
1	Hissar ...	...	...	...	...	201	239	608	760	...	...	...	...
2	Rohtak ...	2	3	...	...	404	491	2,319	2,146	1	2	...	...
3	Gurgaon ...	...	...	...	...	234	215	499	576	...	-	-	...
4	Karnal ...	...	...	...	...	213	206	823	776	...	...	...	...
5	Ambala ...	...	-	...	...	117	88	232	215	...	...	...	...
6	Simla ...	...	...	...	...	...	...	...	1	...	...	...	...
7	Kangra ...	...	...	...	...	42	29	853	847	1	...	...	...
8	Hoshiarpur ...	3	2	...	...	119	122	303	253	2	1	...	...
9	Jullundur ...	...	...	...	-	147	110	165	168	...	...	...	...
10	Ludhiana ...	1	1	...	...	200	160	118	145	1	...	...	...
11	Ferozepore ...	...	1	...	...	426	354	374	365	...	...	...	...
12	Lahore ...	78	72	...	...	1,320	1,837	662	319	84	64	...	...
13	Amritsar ...	4	1	...	...	715	665	7.9	659	6	6	...	...
14	Gurdaspur ...	42	34	1	2	320	399	287	352	20	16	1	
15	Sialkot ...	168	219	59	76	1,366	2,155	678	882	146	223	52	7
16	Gujranwala ...	88	107	26	28	1,463	2,278	329	416	88	128	28	3
17	Sheikhupura ...	62	55	45	34	991	996	343	293	93	63	33	3
18	Gujrat ...	7	6	4	2	4,034	4,794	241	233	3	2	4	...
19	Shahpur ...	20	16	...	...	917	1,163	70	79	18	15	...	...
20	Jhelum ...	1	...	...	...	706	903	29	46	...	...	...	...
21	Rawalpindi ...	-	...	1	...	536	693	44	46	...	...	...	...
22	Attock ...	...	...	...	...	477	505	12	18	...	...	...	...
23	Mianwali ...	...	-	...	...	492	444	* 51	45	...	...	...	...
24	Montgomery ...	19	13	3	1	518	494	221	251	18	13	1	
25	Lyallpur ...	84	64	2	6	726	990	226	257	60	52	...	
26	Jhang ...	1	1	...	...	525	542	102	127	...	...	...	...
27	Multan ...	1	5	2	...	596	587	12	37	3	2	1	...
28	Muzaffargarh ...	...	...	...	...	267	216	30	28	...	...	...	...
29	Dera Ghazi Khan ...	-	...	1	2	362	233	35	21	...	...	2	
	Total ...	581	660	144	151	19,454	21,908	10,375	10,371	544	587	122	15
	Population according to Census of 1921.	28,011	24,222	158	128	770,728	584,428	591,587	438,614	22,692	16,848	177	13
	Ratio per 1,000 living for the Province.	20·74	24·77	911·39	?	23·94	37·49	17·54	23·64	23·97	34·84	689·27	?

IV—CONTINUED.

RIODS IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924—CONTINUED.

8								9								
FIFTEEN YEARS AND UNDER TWENTY YEARS.								TWENTY YEARS AND UNDER THIRTY YEARS.								
Muhammadans.		*Hindus.*		*Indian Christians.*		*Other classes.*		*Muhammadans.*		*Hindus.*		*Indian Christians.*		*Other classes.*		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Number.
70		71	72	73	74	75	76	77	78	79	80	81	82	83	84	1
291	371	448	500	...	...	...	...	261	308	660	768	...	...	...	...	1
515	603	2,271	2,082	1	4	...	...	511	415	2,725	2,451	2	5	...	...	2
112	196	579	427	...	...	...	...	340	326	729	693	...	...	...	...	3
143	122	1,097	978	...	...	...	...	610	561	2,041	1,888	...	...	1	...	4
103	71	180	200	1	...	...	...	323	291	483	512	...	...	...	...	5
1	...	1	1	...	1	...	...	3	3	4	3	2	1	...	...	6
48	40	884	893	...	...	...	...	44	48	982	976	...	...	...	...	7
78	73	229	280	2	...	...	...	215	222	482	714	3	4	...	...	8
118	131	138	124	...	...	...	...	207	201	374	330	...	...	...	...	9
181	197	203	160	1	1	...	...	207	295	250	166	2	...	...	...	10
321	329	328	294	...	1	...	...	345	311	299	309	...	...	...	...	11
018	1,392	521	280	58	46	...	...	2,329	2,245	885	691	76	66	...	...	12
612	629	608	626	4	4	...	...	698	562	495	557	3	5	...	...	13
222	275	217	271	8	21	...	1	407	495	414	449	40	23	2	4	14
001	1,158	516	670	113	136	41	49	1,432	1,799	708	736	148	163	53	58	15
887	1,154	196	257	52	67	15	19	1,481	1,485	309	296	93	83	32	23	16
103	1,098	317	277	95	53	40	32	1,161	1,142	372	323	65	72	48	34	17
276	3,663	174	153	3	5	1	3	4,039	4,518	253	227	2	2	...	2	18
524	553	49	53	7	8	...	...	962	970	99	104	16	15	...	..	19
435	453	36	31	...	...	...	...	836	1,088	70	74	...	2	...	...	20
544	529	35	33	...	...	1	1	816	878	43	93	1	...	...	...	21
303	315	17	17	...	...	...	...	752	774	30	25	...	...	...	...	22
505	475	46	39	...	...	...	...	482	459	48	53	...	...	...	...	23
486	440	197	202	18	13	2	...	834	645	163	261	22	15	1	2	24
330	312	212	378	56	25	1	2	370	739	514	298	70	60	4	4	25
470	448	73	96	...	...	...	...	505	418	85	131	1	...	...	...	26
490	473	15	23	1	3	...	...	761	834	68	69	2	1	...	1	27
235	154	28	45	...	...	...	...	714	760	84	131	...	...	...	...	28
271	191	23	28	...	...	1	1	764	738	64	98	..	...	5	6	29
4,625	15,848	9,638	9,418	420	388	102	108	22,410	23,330	13,733	13,423	548	522	146	137	
5,702	405,557	436,767	317,417	16,312	11,736	182	133	943,910	833,320	812,778	645,951	33,068	23,019	374	357	
28·86	39·08	22·07	29·67	25·75	33·06	560·44	812·03	23·74	28·00	16·90	20·78	16·57	22·68	390·37	383·75	

ANNUAL FOR

DEATHS REGISTERED BY SEXES AND CLASSES ACCORDING TO SPECIFIED A

1	2	10											
		THIRTY YEARS AND UNDER FORTY YEARS.								FORTY YEARS AND UNI			
Number.	Districts.	*Muhammadans.*		*Hindus.*		*Indian Christians.*		*Other classes.*		*Muhammadans.*		*Hindus.*	
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
1	2	85	86	87	88	89	90	91	92	93	94	95	96
1	Hissar	201	299	677	692	...	...	...	...	310	220	503	6
2	Rohtak	429	311	2,546	2,473	1	3	...	...	617	516	1,982	2,0
3	Gurgaon ...	303	268	698	652	...	...	...	...	204	285	780	6
4	Karnal	300	344	1,127	1,074	1	...	...	...	600	454	2,043	1,9
5	Ambala ...	383	228	450	550	...	...	...	...	407	261	526	4
6	Simla	33	20	37	31	7	4	...	...	39	36	86	
7	Kangra ...	58	39	1,071	1,053	1	...	...	...	56	46	1,242	1,1
8	Hoshiarpur ...	233	197	468	551	3	2	...	...	235	197	579	4
9	Jullundur ...	225	204	361	332	...	...	...	...	282	257	348	2
10	Ludhiana ...	201	211	437	415	...	1	...	...	217	202	749	7
11	Ferozepore ...	402	365	310	323	...	...	...	...	596	604	611	6
12	Lahore	1,925	1,950	772	539	73	82	...	...	1,622	1,714	793	5
13	Amritsar ...	665	628	461	6.5	5	3	...	1	686	576	485	5
14	Gurdaspur ...	413	433	433	444	40	28	3	1	470	354	476	3
15	Sialkot ...	1,218	1,363	702	697	132	135	47	49	1,181	1,220	665	5
16	Gujranwala ...	1,273	1,078	263	222	78	58	24	13	1,135	890	228	2
17	Sheikhupura ...	1,139	1,165	366	313	77	86	37	39	1,270	1,259	310	2
18	Gujrat	4,058	4,410	262	220	..	3	2	1	3,758	3,951	221	2
19	Shahpur ...	1,009	935	98	84	18	7	...	...	782	751	86	6
20	Jhelum	1,075	1,160	55	67	1	1	...	...	870	945	76	6
21	Rawalpindi ...	896	872	70	79	1	1	...	...	790	725	47	5
22	Attock	974	912	26	22	...	...	...	...	805	705	32	2
23	Mianwali ...	478	486	53	42	...	...	...	...	442	485	45	3
24	Montgomery ...	800	787	185	136	21	16	2	1	685	710	216	16
25	Lyallpur ...	525	639	237	214	24	71	...	2	358	229	322	41
26	Jhang	527	440	117	140	1	...	...	...	597	516	144	15
27	Multan	621	617	159	322	9	7	1	...	653	559	149	19
28	Muzaffargarh ...	853	881	93	103	...	...	...	...	796	626	99	8
29	Dera Ghazi Khan ...	971	969	79	76	...	...	5	3	969	741	69	5
	Total ...	22,218	22,211	12,683	12,491	493	508	121	110	21,432	20,054	13,912	13,016
	Population according to Census of 1921.	794,114	666,352	643,616	511,228	22,481	17,177	361	265	568·025	486,332	474,779	385,058
	Ratio per 1,000 living for the Province.	27·98	33·33	19·71	24·43	21·93	29·57	335·18	415·09	37·73	41·26	29·30	33·72

IV—CONTINUED.

IODS IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924—CONTINUED.

				12								13				
YEARS.				FIFTY YEARS AND UNDER SIXTY YEARS.								SIXTY YEARS AND UPWARDS.				
Christians.		Other classes.		Muhammadans.		Hindus.		Indian Christians.		Other classes.		Muhammadans.		Hindus.		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Number.
98		99	100	101	102	103	104	105	106	107	108	109	110	111	112	1
	...	...	...	398	290	295	403	1	...	...	...	448	313	566	783	1
1	...	...	...	401	305	1,892	1,860	3	3	...	...	416	513	2,070	1,761	2
	...	..	...	270	252	672	563	..	..	...	...	419	372	914	929	3
	...	1	...	130	106	1,638	1,427	...	...	...	...	800	638	1,747	1,787	4
	...	..	...	391	215	517	423	1	...	...	...	534	463	1,855	1,363	5
17	...	...	...	19	14	120	105	4	2	...	...	11	9	69	27	6
1	...	...	...	68	50	1,525	1,977	...	...	...	...	63	39	1,857	1,612	7
3	...	...	..	275	192	666	394	2	1	...	...	943	625	2,242	1,660	8
	...	...	...	352	329	438	371	...	...	...	...	1,388	1,229	1,421	1,371	9
1	...	...	...	406	395	883	763	1	...	...	...	413	425	1,041	758	10
1	...	...	..	987	891	796	782	2	1	...	...	1,188	1,116	1,452	1,382	11
56	...	...	...	1,254	1,248	792	489	67	55	...	..	1,975	1,471	1,633	1,344	12
4	...	...	...	643	609	640	607	2	2	1	...	1,522	1,414	1,517	1,407	13
19	...	...	1	489	332	479	384	29	22	3	...	1,418	1,093	1,433	1,166	14
106	47	37		1,159	1,101	659	490	123	97	43	35	2,283	1,829	1,022	870	15
59	21	12		1,001	768	218	156	64	36	23	7	2,240	1,494	558	493	16
64	30	43		1,146	1,050	352	343	89	75	34	41	1,352	1,286	393	411	17
8	2	2		3,376	3,379	173	179	...	1	...	...	4,874	4,311	271	265	18
8	...	...		828	592	88	64	5	7	...	...	1,713	1,285	247	175	19
	...	...	...	823	781	65	48	...	...	...	...	1,744	1,584	180	139	20
	2	1	...	690	576	57	43	1	...	...	...	1,467	1,296	217	196	21
	...	...	...	666	606	72	32	...	...	...	...	1,350	1,169	107	92	22
	...	...	..	446	485	53	30	1	...	...	...	838	720	81	60	23
14	1	2		612	526	195	133	19	12	1	1	1,015	910	389	185	24
66	5	14		490	379	212	188	66	49	...	1	1,513	994	421	558	25
1	...	...		779	637	175	163	4	2	...	...	1,199	957	156	168	26
15	...	1		752	487	137	240	8	10	2	...	1,725	1,295	222	184	27
...	...	...		671	465	95	51	...	...	..	...	1,273	874	173	162	28
...	5	4		860	534	111	60	...	...	2	1	1,480	907	156	130	29
446	113	116		20,382	17,696	14,015	12,021	492	375	109	86	37,584	30,631	24,410	21,388	
12,104	264	261		397,385	320,366	339,811	261,590	9,704	7,704	160	156	437,197	321,889	334,927	253,383	
36·85	428·03	444·64		51·29	55·24	41·24	45·95	50·70	48·68	681·25	551·28	85·97	95·16	72·88	84·41	

ANNUAL FO

DEATHS REGISTERED BY SEXES AND CLASSES ACCORDING TO SPECIFIED

1	2	13—*concluded.*				14				
		SIXTY YEARS AND UPWARDS—CONCLUDED.				TOTAL.				
Number.	Districts.	*Indian Christians.*		*Other classes.*		*Muhammadans.*		*Hindus.*		*Indian Chris*
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.
1	2	113	114	115	116	117	118	119	120	121
1	Hissar	...	...	...	...	4,578	4,652	8,662	8,826	1
2	Rohtak ...	1	2	...	...	6,115	5,687	23,439	22,834	29
3	Gurgaon ...	...	...	...	...	3,431	3,425	8,208	7,443	1
4	Karnal ...	...	...	...	...	5,717	5,014	14,454	13,225	2
5	Ambala ...	...	...	...	...	3,714	2,958	8,304	7,586	2
6	Simla ...	3	1	...	...	109	82	321	228	31
7	Kangra ...	1	...	...	...	704	598	13,257	12,203	3
8	Hoshiarpur ...	4	2	...	...	4,679	4,067	10,932	9,819	31
9	Jullundur ...	...	...	...	...	5,843	5,225	6,954	6,631	...
10	Ludhiana ...	...	...	...	...	3,271	3,102	6,032	5,333	13
11	Ferozepore ...	3	4	...	...	8,836	8,078	8,637	7,857	11
12	Lahore ...	95	86	...	...	20,003	20,570	8,637	6,177	772
13	Amritsar ...	6	7	...	...	10,425	9,592	9,555	9,342	57
14	Gurdaspur ...	98	74	6	7	8,267	7,736	8,045	7,525	702
15	Sialkot ...	232	174	79	59	16,861	18,021	8,321	8,383	1,817
16	Gujranwala ...	174	135	58	40	16,285	15,985	3,618	3,487	1,036
17	Sheikhupura ...	98	91	52	65	11,861	11,458	3,813	3,343	850
18	Gujrat ...	4	4	4	5	38,537	40,544	2,371	2,162	33
19	Shahpur ...	13	12	...	...	12,634	12,064	1,424	1,239	206
20	Jhelum ...	1	1	...	...	10,433	10,625	844	787	4
21	Rawalpindi ...	2	...	1	...	9,401	9,048	1,102	1,032	11
22	Attock ...	...	...	...	...	8,960	8,274	524	467	...
23	Mianwali ...	...	...	...	...	5,876	5,331	634	549	1
24	Montgomery ...	30	19	2	3	9,898	8,484	3,050	3,130	303
25	Lyallpur ...	114	127	1	2	10,709	10,492	5,230	5,046	850
26	Jhang ...	...	...	...	...	9,214	8,208	1,610	1,779	13
27	Multan ...	12	10	...	...	12,241	10,904	2,380	2,629	97
28	Muzaffargarh ...	...	...	...	...	8,368	7,315	1,193	1,097	...
29	Dera Ghazi Khan ...	...	...	2	...	9,329	7,397	1,087	933	...
	Total ...	891	749	205	181	276,599	264,336	172,638	161,092	6,846
	Population according to Census of 1921.	11,268	7,482	147	146	...	...	...	...	...
	Ratio per 1,000 living for the Province.	79·07	100·11	?	?	...	...	...	...	...

V—CONCLUDED.

ODS IN THE DISTRICTS OF THE PUNJAB DURING THE YEAR 1924—CONCLUDED.

15												
		RATIO OF DEATHS PER 1,000 OF POPULATION.										
her classes.		*Muhammadans.*		*Hindus.*		*Indian Christians.*		*Other classes.*		*Total.*		
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Number.
	124	125	126	127	128	129	130	131	132	133	134	1
	...	40·55	45·14	26·89	31·78	2·06	...	...	...	30·40	35·35	1
	...	93·38	85·43	67·61	78·59	5·59	7·09	...	...	70·88	78·77	2
	...	29·59	33·94	32·68	35·00	1·64	1·77	...	...	31·65	34·59	3
2	...	45·05	46·13	44·48	49·94	1·12	0·64	142·86	...	44·47	48·63	4
	...	35·09	34·01	32·92	39·43	1·22	...	...	...	33·30	37·53	5
	...	23·64	65·32	14·98	22·34	63·66	79·03	...	...	16·70	25·19	6
	...	33·48	34·75	35·79	34·59	21·13	14·08	...	...	35·52	34·45	7
	...	30·15	30·31	32·02	33·52	15·64	16·90	...	...	31·37	32·45	8
	...	29·66	31·49	27·72	33·62	...	...	...	...	28·43	32·62	9
	...	30·64	35·99	28·56	32·96	15·24	12·35	...	...	29·22	33·94	10
	...	34·06	37·39	25·69	29·90	5·41	8·52	...	...	29·20	33·19	11
	...	56·01	72·15	34·06	35·32	34·38	35·96	...	...	46·20	57·13	12
2	2	44·79	10 81	34·27	43·77	8·65	9·05	5 41	10·75	38·65	46·32	13
43	37	35·72	40·55	36·87	43·07	39·20	39·90	614·29	284·62	36·48	41·77	14
40	648	58·38	73·16	54·23	66·67	63 38	75·17	488·55	?	58·53	72·83	15
13	248	66·13	81·18	41·47	52·94	66·44	79·75	?	?	60·85	75·23	16
19	437	52·90	63·27	34·63	40·51	51·02	56·89	?	?	48·24	57·72	17
20	20	103 03	122·21	39·95	41·07	26·57	41·11	742·86	400 00	94·33	110·95	18
	...	39·02	44·30	22·94	24·55	33·18	31·75	...	...	36·38	41·06	19
	...	49·02	50·73	35·79	30·83	20·10	48·00	...	...	46·91	48·57	20
7	3	38·99	41·94	24·20	33·25	6·62	7·54	1·74	4·48	35·99	40·62	21
	...	37·49	36·85	23·04	21·81	...	...	...	...	36·19	35·53	22
1	...	36·14	36·45	23·35	25·18	6·13	...	6·10	...	34·27	34·96	23
24	22	35·22	36·57	28·63	37·36	52·82	46·96	558·14	714·29	33·75	36·98	24
54	52	34·67	41·29	27·39	35·91	37·23	44·84	?	?	32·22	39·74	25
	...	35·91	37·51	33·10	34·60	52·21	21·16	...	...	35·47	37·69	26
9	5	30·86	32·82	28·20	40·28	41·44	39·52	7·62	36·76	30·39	34·08	27
	...	31·18	32·95	29·86	31·52	...	...	...	...	30·98	32·37	28
35	29	41·14	40·06	35·54	34·57	...	...	?	?	40·60	39·49	29
575	1501	45·01	50·66	35·41	40·76	41·42	46·49	*93·78	*222·80	40·85	46·52	
	...	...	...	...	...	...	...	...	...	...	...	
	...	...	...	...	...	...	...	...	...	...	...	

* Figures incorrect due to mis-classification.

NOTE.—The population of military cantonments by different ages cannot be excluded as it is not shown separately in the Census returns.

ANNUAL FORM No. V

CANCELLED AND INCORPORATED IN ANNUAL FORM No. IV.

ANNUAL FORM No. VI.—A.

DEATHS REGISTERED FROM DIFFERENT CAUSES AND BIRTHS REGISTERED IN THE DISTRICTS (RURAL CIRCLES) OF THE PUNJAB DURING THE YEAR 1924.

ANNUAL FORM

DEATHS REGISTERED FROM DIFFERENT CAUSES AND BIRTHS REGISTERED IN THE

1	2	3	4				5	6	7	8	9	10		
			Births.										Injur	
Number.	A.—Rural Circles.	Population according to Census of 1921.	Males.	Females.	Total.	Birth-rate per 1,000 of population.	Cholera.	Smallpox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	*Suicide.*	
													Males.	Females.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	AMBALA DIVISION.													
1	Hissar ...	728,146	15,712	13,822	29,534	40·56	...	36	978	18,330	125	417	4	8
2	Rohtak ...	696,915	15,224	13,616	28,840	41·38	...	13	31,652	16,346	113	965	7	3
3	Gurgaon ..	631,068	16,457	14,852	31,309	49·61	3	135	2,851	10,424	274	1,009	13	39
4	Karnal ...	747,506	15,176	13,263	28,439	38·05	...	10	8,034	22,802	54	614	3	8
5	Ambala ...	582,374	12,007	10,620	22,627	38 81	50	...	35	8,962	222	8,153	...	...
6	Simla ..	14,738	234	225	459	31·04	...	...	...	234	12	9	...	...
	JULLUNDUR DIVISION.													
7	Kangra ...	757,572	14,401	13,439	27,840	36·74	30	32	4	13,693	2,581	3,553	5	5
8	Hoshiarpur ...	865,376	20,272	17,919	38,191	44·13	3	431	72	21,388	6	1,914	2	3
9	Jullundur	713,917	16,388	15,128	31,516	44·15	18	214	67	15,999	111	1,140	9	5
10	Ludhiana ..	484,267	10,919	9,831	20,750	42·85	26	121	189	9,864	120	818	5	2
11	Ferozepore	986,423	19,599	15,764	35,363	35·85	206	52	1,755	21,461	438	939	6	9
	LAHORE DIVISION.													
12	Lahore ...	783,169	15,242	13,357	28,599	36·52	947	190	17,845	15,422	301	1,240	6	7
13	Amritsar ...	75[illegible],251	16,840	15,510	32,350	43·00	38	260	5,260	19,343	725	2,173	2	...
14	Gurdaspur ...	795,596	17,295	16,684	34,579	43·46	89	106	3,263	16,793	887	8,471	...	...
15	Sialkot ..	755,553	15,798	14,279	30,077	39·80	343	167	28,260	16,131	519	1,584	8	4
16	Gujranwala ...	531,961	10,742	9,749	20,491	38·52	8	34	20,489	13,131	283	758	2	2
17	Sheikhupura ..	596,068	11,346	9,802	21,148	35·48	8	90	17,549	11,201	300	283	1	2
	RAWALPINDI DIVISION.													
18	Gujrat ...	778,026	14,522	12,678	27,200	34·96	59	56	63,351	11,943	217	1,726	3	...
19	Shahpur ...	658,017	13,301	11,655	24,956	37·93	27	84	9,532	11,667	83	57	1	...
20	Jhelum ..	443,802	8,723	7,434	16,157	36·41	1	207	8,274	8,924	133	1,156	1	2
21	Rawalpindi ...	483,045	9,385	8,606	17,991	37·24	20	24	2,792	10,516	427	1,711	8	1
22	Attock ..	486,533	9,724	8,078	17,802	36·59	..	83	3,584	11,838	28	648	3	3
23	Mianwali ...	328,270	7,435	6,694	14,129	43·04	..	6	...	10,032	115	191	...	...
	MULTAN DIVISION.													
24	Montgomery ..	678,076	15,940	13,654	29,594	43·64	163	257	4,396	16,447	66	269	7	1
25	Lyallpur ..	898,609	22,143	19,738	41,881	46·61	367	275	6,127	19,342	178	872	4	3
26	Jhang ...	518,862	11,600	10,220	21,820	42·05	22	23	443	13,550	223	1,044	...	...
27	Multan ...	779,519	17,943	15,451	33,394	42·84	5	75	235	20,549	46	338	5	3
28	Muzaffargarh ..	539,192	10,022	8,397	18,419	34·16	...	35	...	15,695	27	108	1	2
29	Dera Ghazi Khan...	428,061	6,790	5,707	12,497	29·19	..	2	...	16,266	62	194	3	4
	Total ...	18,443,502	391,780	346,172	737,952	40·01	2,433	3,018	237,036	418,293	8,676	42,354	109	116

No. VI-A.

DISTRICTS (RURAL CIRCLES) OF THE PUNJAB DURING THE YEAR 1924.

11				12	13	14										15
ries.						Ratio of deaths per 1,000 of population.										
														From all causes.		
Wounds and accidents.	Snake bite and killed by wild beasts.	Rabies.	Total.	All other causes.	Total deaths from all causes.	Cholera.	Smallpox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	For the year.	Mean ratio of previous five years.	Number.
18	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
197	38	2	249	3,368	23,503	...	0·05	1·34	25·17	0 17	0·57	0·34	4·63	32·28	27·91	1
209	19	3	241	3,711	53,041	..	0·12	45·42	23 45	0·16	1 38	0·35	5·32	76·11	2·90	2
217	17	1	287	5,661	20,644	0·004	0·21	4·52	16·52	0·43	1·60	0·45	8·97	32 71	32·47	3
184	34	3	232	3,487	35,233	...	0·01	10·75	30·50	0·07	0·82	0·31	4·66	47 13	37·88	4
...	...	...	...	3,275	20,697	0·09	...	0·06	15·37	0·38	13·99	..	5·62	35·50	35·24	5
...	...	...	...	69	324	...	...	...	15·82	0·81	0·61	...	4·67	21·91	34·89	6
543	34	1	588	6,103	26,584	0·04	0 04	0·01	18·07	3·41	4·69	0·78	8·06	35·09	36·68	7
159	26	17	207	3,698	27,719	0·003	0·50	0·08	24·72	0·01	2 21	0·24	4·27	32·03	27 92	8
155	3	4	176	3,736	21,461	0·03	0·30	0·09	22·41	0·16	1·60	0·25	5·23	30·04	25·41	9
86	2	3	98	4,112	15,348	0·05	0·25	0·39	20·37	0·25	1·69	0·20	8 49	31·69	2·16	10
223	34	11	283	6,040	31,174	0 21	0·05	1·78	21·76	0·44	0·95	0·23	6·12	31·60	25·23	11
207	42	7	269	4,574	40,788	1·21	0·24	22·79	19·69	0·38	1·58	0·34	5·84	52·08	24 14	12
152	9	5	168	3,727	31,694	0·05	0·35	6·99	25·71	0·96	2·89	0·22	4·95	42·13	26 98	13
...	13	1	14	1,246	30,868	0·11	0·13	4·10	21·11	1·11	15·65	0·02	1·57	38·80	28·36	14
188	13	15	228	4,002	51,234	0·45	0·22	37·40	21·35	0·69	2·10	0·30	5 30	67·81	32·04	15
113	46	10	173	2,235	37,141	0·02	0·06	33·52	24·68	0·53	1·42	0·33	4 26	69·82	26·64	16
22	68	8	101	2,618	32,150	0·01	0·15	29·44	18·79	0 50	0·47	0·17	4·39	53·94	19·68	17
110	12	3	128	3,207	80,685	0·08	0·07	81·43	15 35	0·28	2·22	0·16	4·12	103·71	24·43	18
136	29	1	167	3,660	25,267	0 04	0·13	14·49	17·73	0·13	0·89	0·25	5·55	38·40	21·66	19
164	24	1	192	2,254	21,141	0·002	0 47	18·64	20·11	0·30	2·60	0·43	5·08	47·64	29·91	20
148	29	1	187	2,697	18,374	0·04	0·05	5·75	21·77	0·88	3·54	0·39	5·58	38·04	29·90	21
156	7	1	170	1,292	17,643	...	0·17	7·37	24·33	0·06	1·33	0·35	2·66	36·26	26·80	22
87	10	1	98	1,077	11,519	...	0·02		30·56	0·35	0·58	0·30	3·28	35·09	26·77	23
236	59	9	312	2,200	24,110	0·24	0·3	6·48	24·26	0·10	0·40	0·46	3·24	35·56	20·05	24
221	5	10	243	5,030	32,434	0·41	0·30	6 82	21·52	0·20	0·97	0·27	5·60	36·09	22·66	25
156	33	3	192	3,435	18,932	0·04	0·04	0·85	26·11	0·43	2·01	0·37	6·62	36·49	21·54	26
233	60	1	302	3,105	24,655	0·01	0·10	0·30	26·36	0·06	0·43	0·39	3·98	31·63	21·26	27
177	77	3	260	871	16,996	..	0 06	...	29·11	0·05	0·20	0·48	1·62	31·52	27·79	28
98	30	...	135	409	17,06	...	0·004	..	38·00	0·14	0·45	0·32	0·96	39·87	24·26	29
4,577	773	125	5,700	90,919	808,429	0·13	0·16	12·85	22·68	0·47	2·30	0·31	4·93	43·83	27·10	

ANNUAL FOR

DEATHS FROM DIFFERENT CAUSES AND BIRTHS REGISTERED IN THE TOWN

1	2	3	4				5	6	7	8	9	10	1
Number.	B.—Towns.	Population according to Census of 1921.	Births.				Cholera	Small-pox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	I
			Males.	Females.	Total.	Birth-rate per 1,000 of population.							Suici
													Males
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	HISSAR DISTRICT.												
1	Hissar	21,415	412	364	776	36·24	...	25	1	329	26	90	...
2	Hansi	15,425	348	325	723	46·87	...	48	85	149	21	53	.
3	Bhiwani	33,370	754	679	1,433	43·07	...	87	155	316	62	185	1
4	Sirsa	16,241	211	180	391	24·07	...	1		297	33	89	...
5	Fatehabad	2,313	41	30	71	30·70	...	...	...	47	1	12	...
	ROHTAK DISTRICT.												
6	Rohtak	25,240	515	480	995	39·42	...	5	690	424	28	108	...
7	Jhajjar	10,800	273	246	519	48·06	...	5	377	115	19	61	...
8	Beri	7,454	187	172	359	48·16	...	...	217	64	39	42	...
9	Gohana	5,107	87	79	166	32·50	...	...	209	191	5	66	...
10	Bahadurgarh ...	5,955	141	183	324	54·41	...	8	39	118	3	25	...
11	Sonepat	12,981	326	281	607	46·76	...	...	452	237	10	50	...
12	Mehm ...	7,820	127	94	221	28·26	...	6	3	106	8	62	...
	GURGAON DISTRICT												
13	Rewari	23,129	525	461	986	42·63	...	...	217	173	42	112	...
14	Palwal	9,352	285	261	546	58·18	3	3	5	123	15	21	...
15	Firozepur	4,542	144	115	259	57·02	...	...	...	81	7	6	...
16	Hodal	5,854	165	160	325	55·52	...	...	24	87	3	9	
17	Ballabgarh	3,721	118	102	220	59·12	...	3	37	69	11	7	...
18	Faridabad	4,337	107	94	201	46·35	...	1	1	52	5	9	...
	KARNAL DISTRICT.												
19	Karnal	22,845	423	430	853	37·34	1	...	8	490	21	105	...
20	Kaithal	15,477	315	329	644	41·61	...	13	3	470	8	39	...
21	Panipat	27,343	672	669	1,341	49·04	4	1	131	516	39	212	...
22	Shahabad	11,329	243	219	462	40·78	...	...	...	167	11	35	...
23	Thanesar	4,226	56	59	115	27·21	...	...	...	76	...	15	...
	AMBALA DISTRICT.												
24	Ambala	28,581	526	481	1,007	35·23	1	20	1	306	34	124	...
25	Jagadhri	11,544	278	237	515	44·61	.	...	...	315	28	56	...
26	Burya	3,574	77	66	143	40·01	...	...	...	64	3	12	...
27	Sadhaura	7,630	141	148	289	37·88	...	...	...	108	31	87	...
28	Rupar	7,606	167	171	338	44·44	...	...	...	103	23	39	...
	SIMLA DISTRICT.												
29	Simla	26,149	319	280	599	22·91	...	...	...	295	32	31	...
	KANGRA DISTRICT.												
30	Kangra	3,581	59	64	123	34·35	...	1	..	61	16	21	
31	Dharmsala	3,065	33	43	76	24·80	...	...	...	43	4	8	...
32	Palampur	529	1	8	9	17·01	...	...	...	9	2	1	
	HOSHIARPUR DISTRICT.												
33	Hoshiarpur	21,285	471	454	925	43·46	11	17	...	210	4	118	...
34	Khanpur	2,701	55	50	105	38·87	...	3	...	43	...	16	...
35	Hariana	5,205	92	85	177	34·01	...	5	...	101	...	14	...
36	Garhdiwala	5,196	63	38	101	19·44	...	1	...	50	...	21	...
37	Dasuya	3,889	116	110	226	58·11	...	17	...	102	...	27	...
38	Tanda Urmar ...	8,362	194	136	330	39·46	.	27	2	162		50	...
39	Miani	4,934	97	90	187	37·90	...	27	...	139	...	8	...
40	Mukerian	2,346	61	56	117	49·87	...		...	71	1	7	...
41	Una	4,603	74	61	135	29·33	...	13	1	56	.	19	...
42	Anandpur	3,522	44	54	98	27·83	...	5	...	74	...	12	...
	JULLUNDUR DISTRICT.												
43	Jullundur	59,085	1,547	1,431	2,978	50·40	9	22	5	685	186	396	...
44	Kartarpur	8,512	195	199	394	46·29	1	1	165	114	19	52	...
45	Banga	5,089	105	110	215	42·25	...	...	...	66	7	5	1
46	Rahon	5,947	122	102	224	37·67	...	2	...	100	13	13	...
47	Phillaur	4,696	104	86	190	40·46	..	4	..	61	9	38	...
48	Nurmahal	6,845	181	149	330	48·21	...	...	...	135	9	54	1
49	Nakodar	9,434	206	178	384	40·70	..	46	...	164	17	28	...

No. VI-B.

OF THE PUNJAB DURING THE YEAR 1924.

...ies.				12	13	14										15
						Ratio of deaths per 1,000 of population.								From all causes.		
Wounds and accidents.	Snake-bite and killed by wild beasts.	Rabies.	Total.	All other causes.	Total deaths from all causes.	Cholera.	Small-pox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	For the year.	Mean ratio of previous five years.	Number.
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
6	...	...	6	178	655	...	1·17	0·05	15·36	1·21	4·20	0·28	8·31	30·59	35·22	1
7	1	...	8	237	601	...	3·11	5·51	9·66	1·36	3·44	0·52	15·36	38·96	30·52	2
26	...	...	29	507	1,341	...	2·61	4·66	9·50	1·86	5·56	0·87	15·24	40·31	35·86	3
1	...	...	1	117	538	...	0·06	...	18·29	2·03	5·48	0·06	7·20	33·13	33·85	4
...	...	...	...	21	81	...	...	...	20·32	0·43	5·19	...	9·08	35·02	35·97	5
8	...	1	9	186	1,450	...	0·20	27·34	16·80	1·11	4·28	0·36	7·37	57·45	28·41	6
6	...	...	5	153	735	...	0·46	34·91	10·65	1·76	5·65	0·46	14·17	68·06	34·59	7
...	...	...	...	92	454	...	...	29·11	8·59	5·23	5·63	...	12·34	61·91	39·68	8
...	1	...	1	28	500	...	...	40·92	37·40	0·98	12·92	0·20	5·48	97·90	42·80	9
2	...	...	2	41	234	...	1·34	6·55	19·48	0·50	4·20	0·34	6·88	39·29	34·76	10
...	1	...	1	122	872	...		34·82	18·26	0·77	3·85	0·08	9·40	67·18	30·89	11
7	...	...	7	60	252	...	0·77	0·38	13·55	1·02	7·93	0·20	7·67	32·23	Not available.	12
21	...	...	29	327	930	...	...	10·68	7·48	1·82	4·84	1·25	14·14	40·21	23·37	13
1	...	...	1	134	305	0·32	0·32	0·53	13·15	1·60	2·25	0·11	14·33	32·61	43·35	14
1	...	...	3	50	147	...	...	...	17·83	1·54	1·32	0·66	11·01	32·38	37·16	15
5	...	...	6	85	214	...	...	4·10	14·86	0·51	1·54	1·02	14·52	36·56	38·04	16
1	...	...	1	51	179	...	0·81	9·94	18·54	2·96	1·88	0·27	13·71	48·11	40·04	17
...	...	...	...	22	90	...	0·23	0·23	11·99	1·15	2·08	...	5·07	20·75	32·37	18
2	...	...	2	197	824	0·04	...	0·35	21·45	0·92	4·60	0·09	8·62	36·07	44·83	19
...	...	...	...	157	690	...	0·84	0·19	3·37	0·52	2·52	...	10·14	44·58	40·64	20
...	...	1	1	354	1,258	0·15	0·04	4·79	18·87	1·43	7·75	0·04	12·95	46·01	38·75	21
...	...	...	...	82	295	...	...	...	14·74	0·97	3·09	...	7·24	26·04	31·30	22
1	...	...	1	23	115	...	...	...	17·98	...	3·55	0·24	5·14	27·21	35·12	23
...	...	...	...	166	652	0·03	0·70	0·03	10·70	1·19	4·34	...	5·81	22·81	25·16	24
...	...	...	...	142	541	...	...	...	27·29	2·43	4·85	...	12·30	46·86	44·58	25
...	...	...	...	45	124	...	...	...	17·91	0·84	3·36	...	12·59	34·70	47·40	26
...	...	...	...	74	300	...	...	...	14·15	4·06	11·40	...	9·70	39·32	33·34	27
...	...	...	...	85	250	...	...	...	13·54	3·02	5·13	...	11·18	33·87	27·82	28
...	...	...	...	115	473	...	...	...	11·28	1·22	1·19	...	4·40	18·09	23·73	29
...	...	...	...	10	109	...	0·28	...	17·03	4·47	5·86	...	2·79	30·44	31·05	30
1	...	...	1	6	62	...	...	...	14·08	1·31	2·61	0·33	1·96	20·23	24·01	31
...	...	...	...	...	12	...	...	...	17·01	3·78	1·89	...	...	22·68	Not available.	32
3	1	...	4	139	503	0·52	0·80	...	9·87	0·19	5·54	0·19	6·53	23·63	23·06	33
...	...	...	...	24	86	...	1·11	...	15·92		5·92	...	8·89	31·84	5·99	34
...	...	...	...	11	131	...	0·96	...	19·40	...	2·69	...	2·11	25·17	21·17	35
1	...	...	1	18	91	...	0·19	...	9·52	...	4·04	0·19	3·46	17·51	15·43	36
1	...	...	1	36	183	...	4·37	...	26·23	...	6·94	0·26	9·26	47·06	49·68	37
2	...	...	2	35	278	...	3·23	0·24	19·37	...	5·98	0·24	4·19	33·25	30·97	38
...	...	...	...	25	199	...	5·47	...	28·17	...	1·62	...	5·07	40·33	30·40	39
...	...	...	...	41	120	...	...	...	30·26	0·43	2·98	...	17·48	51·15	42·88	40
1	1	...	2	50	141	...	2·82	0·22	12·17	...	4·13	0·43	10·86	30·63	24·81	41
...	...	...	...	14	105	...	1·42	...	21·01	...	3·41	...	3·98	29·81	24·42	42
28	...	1	30	431	1,764	0·15	0·37	0·08	11·59	3·15	6·70	0·51	7·29	29·86	27·75	43
2	...	...	2	106	461	0·12	0·12	19·50	13·39	2·23	6·11	0·23	12·45	54·16	27·84	44
5	...	...	6	31	115	...		...	12·97	1·38	0·98	1·18	6·09	22·60	21·73	45
...	...	...	...	32	160	...	0·34	...	16·82	2·19	2·19	...	5·38	26·90	31·68	46
3	1		4	35	151	...	0·85	...	12·99	1·92	8·09	0·85	7·45	32·16	38·80	47
4	...	...	5	27	230	...	...	...	19·72	1·31	7·89	0·73	3·94	33·60	27·93	48
6	...	...	6	50	311	...	4·88		17·38	1·80	2·97	0·64	5·30	32·97	22·96	49

ANNUAL FORM

DEATHS FROM DIFFERENT CAUSES AND BIRTHS REGISTERED IN THE TOWN

1	2	3	4				5	6	7	8	9	10	
Number.	B.—Towns.	Population according to Census of 1921.	Births.				Cholera.	Smallpox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries. Suicide.
			Males.	Females.	Total.	Birth-rate per 1,000 of population.							Males.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	LUDHIANA DISTRICT.												
50	Ludhiana	51,880	897	922	1,819	35·06	2	7	1	474	138	467	...
51	Jagraon	17,731	445	392	837	47·21	28	8	5	201	37	101	
52	Raekot	8,379	194	182	376	44·87	...	..	1	151		29	...
53	Khanna	5,365	92	99	191	35·60	...	10	...	45	11	28	...
	FEROZEPORE DISTRICT.												
54	Ferozepore	29,695	492	420	912	30·71	19	1	139	407	19	68	...
55	Zira	4,622	118	82	200	43·27	...	...	..	84	7	16	...
56	Dharmkot ...	5,960	131	144	275	46·14	4	...	...	67	12	15	...
57	Muktsar	10,539	236	199	435	41·28	...	...	4	109	18	48	
58	Fazilka	13,829	285	241	526	38·04	3	...	6	287	20	85	...
59	Moga	14,145	138	122	260	18·38	1	.	...	74	5	16	
60	Abohar	8,916	135	116	251	28·15	...	2	...	95	8	22	1
61	Gidarbaha	5,178	45	20	65	12·55	...	2	13	24	...	1	...
	LAHORE DISTRICT.												
62	Lahore	257,295	4,516	4,197	8,713	33·86	131	70	1,801	4,896	488	2,305	5
63	Chunian	7,642	149	153	302	39·52	15	5	226	177	10	31	...
64	Khudian	3,344	90	94	184	55·02	...	...	25	115	13	26	...
65	Kasur	31,018	679	630	1,309	42·20	145	...	614	406	57	138	1
66	Khem Karn	6,152	169	134	303	49·25	18	...	26	113	7	45	...
67	Patti	10,439	222	204	426	40·81	27	...	211	212	15	37	...
68	Baghbanpura-Bhogiwal ...	10,251	234	207	441	43·02	19	...	264	223	4	49	..
69	Ichhra	3,584	73	62	135	37·67	3	1	22	39	1	11	...
70	Pattoki Mandi	3,836	105	75	180	46·92	92	...	87	107	5	23	...
	AMRITSAR DISTRICT.												
71	Amritsar	157,031	4,437	3,966	8,403	53·51	152	201	157	3,505	147	1,794	...
72	Majitha	5,664	152	124	276	48·78	..	2	1	96	19	24	...
73	Jandiala	7,464	154	139	293	39·26	...	2	1	111	10	25	
74	Tarn Taran	5,988	98	104	200	33·40	1	3	...	68	15	12	..
	GURDASPUR DISTRICT.												
75	Gurdaspur	8,906	159	144	303	34·02	3	1	23	213	43	81	...
76	Dinanagar	4,047	113	103	216	53·37	...	...		86	24	46	...
77	Pathankot	7,353	139	180	319	43·38	...	...		106	23	100	...
78	Dalhousie	1,457	2	7	9	6·18	...	...	...	3	1	4	...
79	Batala	26,122	737	634	1,371	52·48	13	19	14	499	38	280	...
80	Dera Nanak	4,333	102	87	189	43·62	12	2	7	57	12	25	...
	SIALKOT DISTRICT.												
81	Sialkot	56,018	1,547	1,479	3,026	54·02	20	3	180	893	105	305	...
82	Daska	6,283	133	112	245	38·99	1	1	186	89	5	18	..
83	Jamke	3,621	71	80	151	41·70	..	...	94	54	...	7	...
84	Pasrur	6,909	148	154	302	43·71	11	...	85	158	10	33	...
85	Zaffarwal	3,873	71	51	122	31·50	2	...	38	91	4	8	..
86	Narowal	5,343	135	103	238	44·54	...	..	57	60	9	12	...
87	Sambrial ...	3,324	76	79	155	46·63	9	...	8	81	...	17	...
88	Sahowala	3,410	64	45	109	31·96	4	...	27	49	1	8	...
89	Begowala ...	3,697	57	61	118	31·92	5		1	153	...	..	...
90	Bhopalwala	3,767	79	59	138	36·63	1	...	48	61	4	9	...
91	Mitranwali	3,177	96	67	163	51·31	2	...	100	81	6	8	...
92	Badomali	2,849	51	34	85	29·83	1	...	207	42	5	1	...
93	Kalaswala	2,846	65	60	125	43·92	.	...	53	33	3	8	..
94	Daud	3,285	66	56	122	37·14	..	...	155	81	...	...	..
95	Chawinda ..	4,979	104	85	189	37·97	...	1	89	90	2	14	...
	GUJRANWALA DISTRICT.												
96	Gujranwala	37,887	835	651	1,486	39·22	6	6	497	600	55	399	2
97	Wazirabad	18,645	357	292	649	34·81	24	3	261	281	42	127	2
98	Eminabad	5,816	135	111	246	43·30	...	...	121	73	10	17	1
99	Kila Didar Singh ...	2,544	78	69	147	57·78	...	...	77	24	7	7	...
100	Akalgarh	5,147	120	84	204	39·63	...	...	53	48	4	21	...
101	Ramnagar	4,632	86	82	168	36·27	...	33	365	82	10	9	...
102	Sohdra	4,260	116	98	214	50·35	5	3	207	73	6	24	...
103	Hafizabad	8,854	170	149	319	36·03	1	5	120	160	11	27	...
104	Pindi Bhattian	3,845	93	66	159	41·35	...	1	12	36	5	14	...
	SHEIKHUPURA DISTRICT.												
105	Khangah Dogran ...	5,301	28	31	59	11·34	...	...	10	22	...	...	...
106	Sangla	5,961	64	38	102	17·11	...	4	110	20	1	2	.
107	Sharakpur	4,127	90	68	158	38·28	1		102	101	3	10	...
108	Shahkot	1,545	32	25	57	36·89	...	1	23	16	3	2	...
109	Chuharkana Mandi ...	3,847	30	27	57	14·82	...	...	32	17	2	5	...
110	Nankana Sahib ...	11,733	108	85	193	16·45	...	...	135	49	...	2	...

No. VI-B—CONTINUED.

OF THE PUNJAB DURING THE YEAR 1924—CONTINUED.

				12	13	14										15
ITS.						RATIO OF DEATHS PER 1,000 OF POPULATION.										
Wounds and accidents	Snake-bite and killed by wild beasts.	Rabies.	Total.	All other causes.	Total deaths from all causes.	Cholera	Smallpox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	*From all causes.* For the year.	*From all causes.* Mean ratio of previous five years.	Number.
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
6	1	..	7	278	1,374	0·04	0·13	0·02	9·14	2·66	9·00	0·13	5·36	26·48	31·75	50
5	...	..	5	226	611	1·58	0·45	0·28	11·34	2·09	5·70	0·28	12·75	34·46	29·20	51
2	..	...	2	111	298	...	...	0·12	18·02	0·48	3·46	0·24	13·25	35·57	24·87	52
..	..	...	..	35	129	...	1·86	...	8·39	2·05	5·22	...	6·52	24·04	20·54	53
2	...	...	2	125	771	0·34	0·03	4·68	13·71	0·64	2·29	0·07	4·21	25·96	20·46	54
...	...	1	1	54	162	...	...	...	18·17	1·51	3·46	0·22	11·68	35·05	29·29	55
1	...	...	1	92	191	0·67	...	..	11·24	2·01	2·52	0·17	15·44	32·05	30·64	56
2	...	...	2	111	292	...	...	0·38	10·34	1·71	4·55	0·19	10·53	27·71	22·01	57
4	..	1	5	83	489	0·22	..	0·43	20·75	1·45	6·15	0·36	6·00	35·36	35·04	58
1	..	...	1	58	155	0·07	...	...	5·23	0·35	1·13	0·07	4·10	10·96	Net	59
...	1	...	2	25	154	...	0·22		10·66	0·96	2·47	0·22	2·80	17·27	available.	60
...	...	...	...	4	44	...	0·39	2·51	4·63	...	0·19	...	0·77	8·50		61
159	4	...	168	1,735	11,594	0·51	0·27	7·00	19·03	1·90	8·96	0·65	6·74	45·06	29·73	62
3	...	1	4	77	545	1·96	0·65	29·57	23·16	1·31	4·06	0·52	10·08	71·32	38·63	63
1	...	...	2	50	231	...	...	7·48	34·39	3·89	7·78	0·60	14·95	69·08	47·85	64
17	..	...	18	329	1,707	4·67	...	19·79	13·09	1·84	4·45	0·58	10·61	55·13	27·73	65
2	...	...	2	72	283	2·91	...	4·23	18·37	1·14	7·31	0·33	11·70	46·00	30·62	66
4	..	...	4	100	606	2·59	...	20·21	20·31	1·44	3·54	0·38	9·58	58·05	25·25	67
3	...	...	4	80	643	1·85	..	25·75	21·75	0·39	4·78	0·39	7·80	62·73	29·28	68
...	...	...	...	4	81	0·84	0·26	6·14	10·88	0·28	3·07	...	1·12	22·60	22·60	69
1	...	...	1	47	362	25·98	...	22·68	27·89	1·30	6·00	0·26	12·25	94·37	28·10	70
65	1	...	66	810	6,832	0·97	1·28	1·00	22·32	0·94	11·42	0·42	5·16	43·51	34·42	71
...	..	..	...	42	184	...	0·35	0·18	16·95	3·35	4·24	...	7·42	32·49	25·39	72
...	...		...	46	195	...	0·27	0·13	14·87	1·34	3·35	...	6·16	26·13	22·56	73
...	...	...	...	22	121	0·17	0·50	..	11·36	2·51	2·00		3·67	20·21	15·90	74
...	...	...	..	42	406	0·34	0·11	2·58	23·92	4·83	9·09	...	4·72	45·59	21·04	75
...	...	...	...	43	199	...	...	...	21·25	5·93	11·37	...	10·62	49·17	35·93	76
...	...	...	...	74	303	...	...	...	14·42	3·18	13·60	...	10·06	41·21	37·45	77
...	...	...	...	5	13	...	...	...	2·06	0·69	2·75	...	3·43	8·92	16·61	78
...	...	...	..	152	1,015	0·50	0·73	0·54	19·10	1·45	10·72	...	5·82	38·86	32·36	79
...	...	...	...	20	135	2·77	0·46	1·62	13·15	2·77	5·77	...	4·62	31·16	26·17	80
7	1	...	8	818	2,332	0·36	0·05	3·21	15·94	1·87	5·44	0·14	14·60	41·63	33·04	81
3	...	...	3	38	341	0·16	0·16	29·60	14·17	0·80	2·86	0·48	6·05	54·27	28·55	82
1	...	...	1	24	180	...	...	25·96	14·91	...	1·63	0·28	6·63	49·71	36·56	83
1	...	...	1	68	366	1·59	...	12·30	22·87	1·45	4·78	0·14	9·84	52·97	29·44	84
1	...	...	1	18	162	0·52	...	9·81	23·50	1·03	2·07	0·26	4·65	41·83	23·44	85
...	...	...	..	53	191	...	...	10·67	11·23	1·68	2·25	...	9·92	35·75	29·27	86
..	...	...	...	14	129	2·71	...	2·41	24·37	...	5·11		4·21	38·81	30·75	87
2	...		2	15	106	1·17	...	7·92	14·37	0·29	2·35	0·59	4·40	31·09	30·73	88
...	...	...	..	6	165	1·35	..	0·27	41·38	..		...	1·62	44·63	26·29	89
3	...	...	3	15	141	0·27	...	12·74	16·19	1·06	2·39	0·80	3·98	37·43	28·62	90
2	1	...	3	27	287	0·63	...	50·36	25·50	1·89	2·52	0·94	8·50	90·34	37·71	91
...	...	...	...	8	264	0·35	...	72·66	14·74	1·76	0·35	...	2·81	92·66	23·31	92
..	...	...	..	36	133	...	...	18·62	11·60	1·05	2·81	...	12·65	45·73	37·89	93
...	...	...	...	14	250	...		47·18	24·66	..		...	4·26	76·10	33·79	94
3	...	...	3	52	251	...	0·20	17·88	18·08	0·40	2·81	0·60	10·44	50·41	25·35	95
44	2	...	49	337	1,949	0·16	0·16	13·12	15·84	1·48	10·53	1·29	8·89	51·44	38·81	96
10	...	...	12	111	841	1·29	0·16	14·00	15·07	1·18	6·81	0·64	5·95	45·11	29·73	97
3	...	1	5	34	260		...	20·80	12·55	1·72	2·92	0·86	5·85	44·70	21·53	98
2	...	...	2	29	146	...	...	30·27	9·43	2·75	2·75	0·79	11·40	57·39	23·82	99
2	2	...	4	27	157	...	...	10·30	9·33	0·78	4·08	0·78	5·25	30·50	17·99	100
2	1	...	3	41	543	...	7·12	78·80	17·70	2·16	1·94	0·65	8·85	117·23	30·18	101
1	...	...	1	62	381	0·56	0·34	23·38	8·24	0·68	2·71	0·11	7·00	43·03	30·02	102
12	...	...	12	56	392	0·24	1·18	28·24	37·65	2·59	6·35	2·82	13·18	92·24	17·66	103
...	...	1	1	24	93	...	0·26	3·12	9·36	1·30	3·64	0·26	6·24	24·19	24·08	104
...	...	...	...	11	43	...	...	1·92	4·23	...	..	...	2·11	8·27	7·69	105
...	...	...	...	14	151	..	0·67	18·45	3·36	0·17	0·34	...	2·35	25·33	6·54	106
..	...	...	...	58	275	0·24	...	24·71	24·47	0·73	2·42	...	14·15	66·63	25·39	107
...	...	...	...	8	53	...	0·65	14·89	10·36	1·94	1·29	..	5·18	34·30	22·27	108
...	...	...	...	18	74	...	..	8·32	4·42	0·52	1·30	...	4·68	19·24	6·97	109
...	...	...	...	9	195	...	...	11·51	4·18	...	0·17	...	0·77	16·62	9·56	110

ANNUAL FORM

DEATHS FROM DIFFERENT CAUSES AND BIRTHS REGISTERED IN THE TOWNS

1	2	3	4				5	6	7	8	9	10		
Number.	B. Towns.	Population according to Census of 1921.	Births.				Cholera.	Smallpox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	I	
			Males.	Females.	Total.	Birth-rate per 1,000 of population.							*Suicide.*	
													Males.	Females.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	GUJRAT DISTRICT.													
111	Gujrat	21,974	538	515	1,053	47·92	2	2	450	345	28	153	2	...
112	Jalalpur	10,782	277	226	503	46·61	3	3	459	202	14	118	...	...
113	Kunjah ...	7,240	145	132	277	38·26	...	1	838	128	4	39	-	...
114	Dinga	6,014	87	66	153	25·44	17		140	37	8	23	...	...
	SHAHPUR DISTRICT.													
115	Shahpur	4,590	106	78	184	40·09	...	..	85	117	15	11	-	...
116	Sahiwal	6,582	174	158	332	50·44	...	..	76	143	11	5	...	-
117	Bhera ...	17,027	427	409	836	49·10	7	5	212	270	42	19	...	...
118	Miani	5,965	119	90	209	35·04	1	20	185	118	2	4	...	-
119	Khushab	10,009	264	260	524	52·35	...	..	9	198	14	5	...	...
120	Sargodha	17,798	275	220	495	27·92	...	1	60	98	16	16	...	...
	JHELUM DISTRICT.													
121	Jhelum ...	14,492	237	214	451	31·27	...	4	206	193	24	125	...	...
122	Pind Dadan Khan ...	9,919	223	235	458	46·17	...	78	131	151	18	29	...	...
123	Chakwal	7,425	138	101	239	32·19	...	...	188	69	6	50	...	-
	RAWALPINDI DISTRICT.													
124	Rawalpindi	55,251	1,180	1,108	2,288	41·41	30	22	147	888	116	470	1	...
125	Murree	2,397	34	23	57	23·78	...	...	...	9	...	6	...	...
	ATTOCK DISTRICT.													
126	Pindigheb	9,419	199	193	392	41·62	-	2	5	134	6	29	...	...
127	Hazro	8,408	189	159	348	41·39	5	1	78	82	8	29	...	...
128	Campbellpur	3,669	44	23	67	18·26	...	3	15	6	...	9	...	...
	MIANWALI DISTRICT.													
129	Mianwali	9,115	212	157	369	40·48	...	...	..	123	...	17	...	...
130	Bhakkar	6,193	135	127	262	42·30	...	...	...	200	3	9	...	...
131	Isa Khel	6,172	156	132	288	46·66	...	...	4	93	12	36	...	...
132	Kalabagh	8,455	183	151	334	39·50	...	...	...	175	4	37	...	...
	MONTGOMERY DISTRICT.													
133	Montgomery	14,601	133	102	235	16·09	10	1	106	91	7	20	...	...
134	Kamalia	8,916	219	185	404	45·31	1	1	8	227	6	13	...	...
135	Pakpattan	7,218	171	145	316	43·78	7	..	35	105	5	6	...	...
136	Okara	4,975	59	60	119	23·92	20	4	58	69	5	24	1	...
	LYALLPUR DISTRICT.													
137	Lyallpur	28,136	330	272	602	21·40	8	3	254	146	10	59	...	...
138	Gojra	7,692	154	119	273	35·52	2	1	51	67	6	26	...	...
139	Samundri	1,575	24	18	42	26·67	1	1	9	13	...	7	...	...
	JHANG DISTRICT.													
140	Jhang-Maghiana ...	30,139	729	656	1,385	45·95	...	3	185	431	71	103	...	...
141	Chiniot	17,713	501	486	987	55·36	...	1	42	193	18	68	..	...
142	Ahmadpur	4,045	73	74	147	36·34	...		...	103	6	18	...	...
	MULTAN DISTRICT.													
143	Multan	89,162	2,088	1,885	3,973	44·56	...	39	142	1,530	153	599	2	...
144	Shujabad	6,730	148	137	285	42·35	..	3	4	167	10	28	...	...
145	Jahania	822	13	7	20	24·33	...	...	...	18	...	4	...	...
146	Mian Channu	2,294	10	7	17	7·41	...	3	...	9	...	1	...	...
147	Khanewal	5,547	47	22	69	12·22	...	..	...	44	1	22	-	...
	MUZAFFARGARH DISTRICT.													
148	Muzaffargarh	5,386	86	88	174	32·31	2	4	...	105	3	19	...	...
149	Khangarh	3,184	70	61	131	41·14	..	...	...	91	8	14	...	...
150	Alipur	3,434	72	92	164	47·76	...	...	...	95	7	5	...	...
151	Leiah ...	8,476	195	144	339	40·00	...		1	213	18	3	...	...
152	Karor	3,539	102	72	174	49·17	...	...	...	145	1	6	...	...
153	Kot Adu	5,267	52	61	113	21·45	...	1	1	91	1	...	...	-
	DERA GHAZI KHAN DISTRICT.													
154	Dera Ghazi Khan ...	20,731	424	331	755	36·42	...	...	1	365	75	81	...	...
155	Jampur	7,317	174	199	373	50·98	...	...		203	6	17	...	...
156	Dajal	5,775	156	111	267	46·23	..	..	...	421	8	2	...	...
157	Rajanpur ...	2,364	97	84	181	75·66	...	...	..	93	1	12	...	-
158	Kot Mithan	3,204	70	52	122	38·08	.	1	...	80	5	2	...	...
	Total ...	2,074,104	43,985	39,748	83,733	40·37	918	1,022	14,225	33,894	3,141	12,134	21	17
	Total of the Province ...	20,517,606	435,765	385,920	821,685	40·05	3,351	4,040	251,261	452,187	11,817	54,488	130	133

. VI-B.—CONCLUDED.

THE PUNJAB DURING THE YEAR 1924—CONCLUDED.

11				12	13	14										15
IES.						RATIO OF DEATHS PER 1,000 OF POPULATION										
														From all causes		
Wounds and accidents.	Snake-bite and killed by wild beasts.	Rabies.	Total.	All other causes.	Total deaths from all causes.	Cholera.	Smallpox.	Plague.	Fevers.	Dysentery and Diarrhœa.	Respiratory diseases.	Injuries.	All other causes.	For the year.	Mean ratio of previous five years.	Number.
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
16	...	...	18	231	1,229	0·09	0·09	20·48	15·70	1·37	6·96	0·82	10·51	55·93	32·59	111
7	...	...	7	105	911	0·28	0·28	42·53	18·72	1·30	10·93	0·65	9·73	84·41	38·36	112
1	...	...	1	44	1,055	...	0·14	115·75	17·68	0·55	5·39	0·14	6·08	145·72	31·10	113
2	...	...	2	27	254	2·83	...	23·28	6·15	1·33	3·82	0·33	4·49	42·23	26·11	114
1	...	...	1	52	281	...	...	18·52	25·49	3·27	2·40	0·22	11·33	61·22	30·41	115
...	...	...	...	97	332	...	...	11·55	21·73	1·67	0·76	...	14·74	50·44	27,62	116
7	...	...	7	313	875	0·41	0·29	12·45	15·86	2·47	1·12	0·41	18 28	51·39	34·66	117
3	...	...	3	49	382	0·17	3·15	31·01	19·78	0·34	0·67	0·50	8·21	64·04	31·45	118
2	...	...	2	51	279	...	...	0·90	19·78	1·49	0·50	0·20	5·10	27·87	26·52	119
6	...	...	6	112	309	...	0·06	3·38	5·53	0·90	0·90	0·34	6·32	17·43	13·55	120
3	...	...	3	114	689	...	0·28	15·67	13·38	1·66	8,67	0·21	7·90	47·77	40·41	121
6	...	...	6	91	504	...	7·86	13·21	15·22	1·81	2·92	0·60	9 17	50·81	30·77	122
6	...	...	6	46	365	...	...	25·32	9·29	0·81	6·73	0·81	6·20	49·16	Not available.	123
27	...	...	28	510	2,211	0·54	0·40	2·66	16·07	2·10	8·51	0·51	9 23	40·02	41·57	124
...	...	...		11	26	...	...	...	3·75	...	2·50	...	4·59	10·85	13·85	125
4	...	...	4	67	247	...	0 21	0·53	14·23	0·64	3,08	0·42	7·11	26·22	24·10	126
2	...	...	2	82	287	0·59	0·12	9·28	9·75	0·95	3·45	0·24	9·75	34·13	28·31	127
5	...	...	5	10	48	...	0·82	4·09	1·64	...	2·45	1·36	2·73	13·08	Not available.	128
1	...	...	1	28	169	...	...	...	13·49	...	1·87	0·11	3·07	18·54	17·88	129
5	...	...	5	47	264	...	...	...	32·29	0·48	1·45	0·81	7·59	42·63	30·68	130
4	...	...	4	20	169	...	...	0·65	15·07	1·94	5·83	0·65	3·24	27·38	31·37	131
7	...	...	7	48	271	...	...	...	0·70	0·47	4·38	0 83	5·68	32·05	30·11	132
17	...	...	17	50	302	0·68	0·07	7·26	6·23	0·48	1·37	1·16	3·42	20·68	11·94	133
2	1	...	3	39	298	0·11	0·11	0·99	25·46	0·67	1·46	0·34	4·37	33·42	26·16	134
4	...		4	58	220	0·97	...	4·85	14·55	0·69	0·83	0·55	8·04	30·48	23·47	135
...	...	...	1	14	195	4·02	0·80	11·63	13·87	1·01	4·82	0·20	2·81	39·19	Not available.	136
...	...	...	...	78	558	0·28	0·11	9·03	5·19	0·36	2·10	...	2·77	19·83	11·44	137
2	...	...	2	83	238	0·25	0·13	6·69	8·79	0·79	3·41	0·26	10·89	31·23	16·66	138
1	...	...	1	5	37	0·63	0·63	5·71	8·25	...	4·44	0·63	3·17	23·49	Not available.	139
7	1	...	8	310	1,111	...	0·10	6·14	14·30	2·36	3·42	0 27	10·29	36·86	29·16	140
8	1	1	4	288	614	...	0·06	2·40	11·02	1·03	3·88	0·23	16·44	35·06	31·47	141
...	1	...	1	43	171	...	...	...	25·46	1·48	4·45	0·25	10·63	42·27	Not available.	142
23	1	1	27	816	3,306	...	0·44	1·59	17·16	1·72	6·72	0·30	9·15	37·08	33·59	143
3	2	...	5	37	254	...	0·45	0·59	24·81	1·49	4·16	0 74	5·20	37·74	34·18	144
...	...	...	...	3	25	...	...	...	21·96	...	4·67	...	3·65	30·41	Not	145
...	...	...	...	4	17	...	1·21	...	3·92	...	0 44	...	1·74	7·41	available.	146
7	...	...	7	13	87	...	...	...	7·79	0·18	3 89	1·24	2·30	15·41		147
...	...	...	...	17	150	0·37	0·74	...	19·49	0·56	3·43	...	3·16	27·85	19·90	148
...	...	...	...	22	135	...	...	...	28·58	2·51	4·40	...	6·91	42 40	34·30	149
...	...	...	...	29	136	...	...	...	27·66	2·04	1·46	...	8·45	39·60	36·28	150
3	...	...	3	31	269	...	...	0·12	25·13	2·12	0·35	0·35	3·66	31·74	26·90	151
1	...	...	1	34	187	...	...	...	40·97	0·28	1·70	0·28	9·61	52·84	39·16	152
...	...	...	...	6	100	...	0·19	0·19	17·28	0·19	...	...	1·14	18·99	Not available.	153
5	1	...	6	169	697	...	...	0·05	17·61	3·62	3·91	0·29	8·15	33·62	21·16	154
...	1	...	1	78	336	...	...	...	27·74	0·82	1·32	0·14	10·66	41·68	29·60	155
1	...	...	1	78	510	...	...	...	72·90	1·39	0 35	0·17	13·51	88·31	38·16	156
...	...	...	...	22	128	...	...	...	23·46	0·25	3·03	...	5·55	32·29	28·15	157
...	...	...		14	102	...	0·31	...	24·97	1·56	0·62	...	4·37	31·84	25·68	158
721	29	10	798	16,465	82,597	0·44	0·49	6 86	16·24	1·51	5·85	0·38	7·94	39·82	29·64	
298	862	135	6,495	107,381	891,026	0 16	0·20	12·24	22·04	0·58	2·66	0·32	5·23	43·43	27·35	

ANNUAL FORM No. VI-C.—APPENDIX TO ANNUAL FORM No. VI-B.

Births and deaths registered in the cantonments of the Punjab during the year 1924.

No.	Cantonments.	Population according to Census of 1921.	Cholera.	Small-pox.	Plague.	Fevers.	Dysentery and Diarrhœa.*	Respiratory diseases.	Injuries.					All other causes.	Total deaths from all causes.	Ratio of deaths per 1,000 of population.	Total births registered during the year.	Ratio of births per 1,000 of population.	No.
									Suicide.										
									Males.	Females.	Wounds and accidents.	Snake-bite and killed by wild beasts.	Total.						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Ambala	36,356	2	...	...	521	43	276	2	...	20	1	23	250	1,115	31	1,523	42	1
2	Kasauli	2,212	...	...	...	27	2	...	...	...	1	16	17	32	78	24	93	29	2
3	Dagshai	1,745	...	...	...	21	2	...	...	...	2	...	2	24	49	28	47	27	3
4	Subathu	1,581	...	...	...	24	2	...	...	...	...	...	...	6	32	20	41	26	4
5	Jutogh	1,064	...	...	...	4	...	...	...	...	...	...	...	12	16	15	12	11	5
6	Dharmsala	1,318	...	...	...	33	6	...	...	..	...	...	...	4	43	33	116	88	6
7	Jullundur	9,019	...	1	2	96	1	31	2	...	6	...	8	27	166	18	206	23	7
8	Ferozepore	18,941	...	1	5	277	21	106	...	...	8	1	9	131	550	29	767	40	8
9	Lahore	14,606	2	1	160	273	3	...	...	...	4	...	4	120	563	39	277	19	9
10	Amritsar	973	...	...	...	17	4	4	...	...	1	..	1	8	34	35	23	29	10
11	Dalhousie	148	...	...	..	11	...	...	...	...	...	..	..	5	16	17	23	24	11
12	Bakloh	3,430	..	...	...	21	...	...	...	...	...	...	...	12	33	10	64	19	12
13	Sialkot	7,123	...	...	10	25	19	..	...	...	...	...	...	149	203	28	163	23	13
14	Jhelum	1,500	...	...	1	8	1	...	...	...	..	...	...	11	21	14	18	12	14
15	Rawalpindi	27,657	2	1	14	133	11	75	...	...	2	...	2	53	291	11	475	17	15
16	Campbellpur	4,190	...	...	3	55	1	...	1	...	...	...	1	4	64	15	45	11	16
17	Murree	874	...	...	...	2	...	..	...	...	...	...	...	7	9	10	23	26	17
18	Attock*	70	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	11	18
19	Multan	6,090	...	...	...	29	4	2	...	...	2	1	3	19	57	9	77	13	19
	Total ...	140,660	6	4	195	1,577	120	494	5	...	46	19	70	874	2,340	24	3,999	28	

ANNUAL FORM No. VII.

DEATHS REGISTERED FROM CHOLERA IN THE DISTRICTS OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

ANNUAL FORM

DEATHS REGISTERED FROM CHOLERA IN THE DISTRICTS

1	2	3		4		5					
Number.	Districts.	Circles of Registration.		Villages.		Mon					
		Number in each district.	Number from which deaths from Cholera were reported.	Number in each district.	Number from which deaths from Cholera were reported.	January.	February.	March.	April.	May.	June.
1	2	3	4	5	6	7	8	9	10	11	12
	AMBALA DIVISION.										
1	Hissar	25	...	960	...	...	...	...	...	...	...
2	Rohtak	20	...	722	...	...	...	...	...	...	...
3	Gurgaon	24	2	1,351	1	...	...	...	...	...	...
4	Karnal	25	2	1,390	...	...	...	...	...	...	1
5	Ambala	19	6	1,715	8	...	...	...	...	...	5
6	Simla	3	...	208	...	...	...	...	...	...	...
	JULLUNDUR DIVISION.										
7	Kangra	17	3	711	5	...	...	...	2	2	3
8	Hoshiarpur	23	2	2,111	2	...	...	...	...	...	1
9	Jullundur	17	6	1,222	5	...	...	...	1	...	1
10	Ludhiana	14	5	858	8	...	...	...	...	...	4
11	Ferozepore	24	12	1,499	13	...	...	...	...	...	...
	LAHORE DIVISION.										
12	Lahore	30	27	1,121	184	...	...	...	...	...	5
13	Amritsar	15	7	1,037	13	...	1	...	...	16	...
14	Gurdaspur	22	13	2,246	37	...	...	...	...	...	1
15	Sialkot	28	22	2,053	48	...	...	...	...	...	...
16	Gujranwala	20	9	1,212	7	...	...	...	...	...	...
17	Sheikhupura ...	20	2	1,214	1	...	...	...	...	...	...
	RAWALPINDI DIVISION.										
18	Gujrat	17	10	1,436	14	...	...	...	...	...	...
19	Shahpur	23	9	986	18	...	...	1	1	...	3
20	Jhelum	15	1	888	1	...	...	...	...	...	...
21	Rawalpindi	14	7	1,170	17	...	...	...	...	...	2
22	Attock	14	1	618	...	...	...	...	...	...	4
23	Mianwali	16	...	375	...	...	...	...	...	...	...
	MULTAN DIVISION.										
24	Montgomery ...	24	19	1,834	80	...	...	...	...	...	4
25	Lyallpur	20	14	973	34	...	...	...	...	...	3
26	Jhang	13	1	981	4	...	...	...	...	...	1
27	Multan	23	3	1,645	4	...	...	...	...	...	...
28	Muzaffargarh ...	24	1	849	...	...	...	...	...	...	...
29	Dera Ghazi Khan ...	23	...	714	...	...	...	...	...	...	...
	Total ...	572	185	34,099	504	...	1	1	4	18	38

No. VII.

OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

						6			7			8	9
ths.						Total.			Ratio of deaths per 1,000 of population.				
July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.	Mean ratio per 1,000 for previous five years.	Number.
13	14	15	16	17	18	19	20	21	22	23	24	25	26
...	...	...	...	...	...	...	...	...	...	...	...	0·45	1
...	...	...	...	...	...	..	...	...	...	...	...	0·19	2
...	3	..	2	1	...	2	4	6	0·01	0·01	0·01	0·49	3
...	1	3	...	...	...	2	3	5	0·004	0·01	0·01	0·35	4
3	20	26	...	...	...	29	22	51	0·08	0·08	0·08	0·23	5
...	...	...	...	...	...	...	...	...	...	...	...	0·04	6
16	...	6	...	1	...	21	9	30	0·05	0·02	0·04	1·51	7
...	5	8	...	...	...	5	9	14	0·01	0·02	0·02	0·13	8
2	4	10	10	...	...	21	7	28	0·05	0·02	0·03	0·08	9
17	13	22	...	...	...	30	26	56	0·09	0·10	0·10	0·08	10
41	116	49	18	...	...	131	93	224	0·22	0·19	0·21	0·11	11
350	560	482	...	...	...	842	555	1,397	1·32	1·16	1·25	0·35	12
12	64	95	2	1	..	107	84	191	0·21	0·20	0·21	0·15	13
10	38	55	13	...	...	74	43	117	0·16	0·11	0·14	0·06	14
45	74	244	36	...	...	235	194	399	0·44	0·49	0·46	0·05	15
...	20	24	...	...	...	21	23	44	0·06	0·08	0·07	0·21	16
...	1	8	..	...	...	7	2	9	0·02	0·01	0·01	0·23	17
5	18	56	2	...	...	35	43	81	0·08	0·12	0·10	0·12	18
1	3	24	2	...	...	17	18	35	0·04	0·05	0·05	0·14	19
...	...	...	1	...	...	1	...	1	0·004	...	0·002	0·11	20
5	...	38	5	...	...	31	19	50	0·11	0·09	0·09	0·57	21
1	...	...	...	...	...	3	2	5	0·01	0·01	0·01	1·16	22
...	...	...	...	...	...	...	...	...	...	...	...	0·97	23
16	130	32	18	1	...	116	85	201	0·30	0·27	0·28	0·01	24
148	125	94	8	...	...	205	173	378	0·39	0·12	0·40	0·33	25
...	21	...	...	...	...	14	8	22	0·05	0·03	0·04	0·09	26
4	...	...	1	...	...	3	2	5	0·01	0·01	0·01	0·02	27
...	...	2	...	...	...	2	...	2	0·01	..	0·003	0·01	28
...	...	...	...	...	...	...	...	...	...	...	...	0·08	29
676	1,216	1,275	118	4	...	1,924	1,427	3,351	0·17	0·15	0·16	0·27	

ANNUAL FORM

DEATHS REGISTERED FROM SMALLPOX IN THE DISTRICTS

1	2	3		4		5						
		Circles of Registration.		Villages.		Mon						
Number.	Districts.	Number in each district.	Number from which deaths from small-pox were reported.	Number in each district.	Number from which deaths from small-pox were reported.	January.	February.	March.	April.	May.	June.	July.
1	2	3	4	5	6	7	8	9	10	11	12	13
	AMBALA DIVISION.											
1	Hissar	25	6	960	10	81	31	18	15	15	13	18
2	Rohtak	20	8	722	9	...	1	1	7	2	7	8
3	Gurgaon	24	16	1,351	25	8	7	13	38	41	27	5
4	Karnal	25	6	1,390	4	3	2	5	...	1	3	6
5	Ambala	19	1	1,715	...	...	...	...	1	1	12	6
6	Simla	3	...	208	...	...	...	...	...	...	...	...
	JULLUNDUR DIVISION.											
7	Kangra	17	9	711	21	9	4	3	5	4	5	2
8	Hoshiarpur	23	21	2,111	96	27	22	32	35	100	110	90
9	Jullundur	17	14	1,222	73	22	21	12	6	27	24	35
10	Ludhiana	14	13	858	42	8	4	2	13	27	29	23
11	Ferozepore	24	16	1,499	21	1	4	13	14	6	13	...
	LAHORE DIVISION.											
12	Lahore	30	21	1,121	27	26	14	26	26	30	39	35
13	Amritsar	15	13	1,037	26	53	37	30	29	50	53	80
14	Gurdaspur	22	16	2,246	79	3	1	2	8	25	27	15
15	Sialkot	28	14	2,053	64	6	14	14	23	13	31	33
16	Gujranwala	20	16	1,312	15	1	3	2	6	11	5	13
17	Sheikhupura	20	6	1,214	26	4	12	13	4	5	16	17
	RAWALPINDI DIVISION.											
18	Gujrat	17	11	1,436	14	3	1	14	6	5	5	1
19	Shahpur	23	11	986	31	12	10	5	5	17	23	7
20	Jhelum	15	13	888	44	9	17	20	30	38	15	25
21	Rawalpindi	14	7	1,170	21	11	3	8	3	1	4	8
22	Attock	14	10	618	23	1	6	2	3	1	3	11
23	Mianwali	16	5	375	6	...	...	1	...	1	3	1
	MULTAN DIVISION.											
24	Montgomery	24	20	1,834	107	15	5	15	39	62	43	22
25	Lyallpur	20	16	973	69	8	10	14	38	78	47	37
26	Jhang	13	8	981	12	7	1	4	4	6	1	2
27	Multan	23	13	1,645	41	15	11	4	24	15	17	10
28	Muzaffargarh	24	11	849	26	...	10	2	4	1	5	4
29	Dera Ghazi Khan	23	2	714	1	...	...	...	...	...	...	2
	Total ...	572	323	34,099	933	333	251	275	386	583	580	516

No. VIII.

OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

THS.					6			7		8			9	10
					TOTAL.			NUMBER OF DEATHS AMONG CHILDREN.		RATIO OF DEATHS PER 1,000 OF POPULATION.				
August.	September.	October.	November.	December.	Males.	Females.	Total.	Under one year.	Over one year and under ten years.	Males.	Females.	Total.	Mean ratio per 1,000 for previous five years.	Number.
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
6	...	...	...	...	104	93	197	101	82	0·24	0·24	0·24	0·34	1
1	...	1	...	9	23	14	37	8	23	0·06	0·04	0·05	0·03	2
2	...	1	...	...	87	55	142	47	90	0·24	0·17	0·21	0·07	3
4	...	...	...	...	15	9	24	1	22	0·03	0·02	0·03	0·10	4
...	...	...	...	...	13	7	20	1	19	0·04	0·02	0·03	0·15	5
...	...	...	...	...	...	...	...	...	...	...	...	...	0·09	
...	...	...	...	1	22	11	33	2	2	0·06	0·03	0·04	0·05	
38	26	12	15	39	293	253	546	119	308	0·59	0·59	0·59	0·66	8
11	7	4	24	96	150	139	289	84	145	0·33	0·38	0·36	0·15	9
14	9	6	4	7	84	62	146	28	84	0·26	0·25	0·26	0·35	10
...	...	...	3	3	27	30	57	9	32	0·05	0·06	0·05	0·11	11
20	22	10	8	10	133	133	266	63	150	0·21	0·28	0·24	0·45	12
45	39	11	21	20	272	196	468	217	172	0·52	0·48	0·50	0·23	13
14	8	7	13	5	77	51	128	29	95	0·16	0·13	0·15	0·19	14
9	7	2	11	9	84	88	172	57	64	0·18	0·22	0·20	0·32	15
9	5	1	21	8	44	41	85	29	52	0·13	0·15	0·14	0·25	16
9	1	1	3	10	53	42	95	27	54	0·15	0·15	0·15	0·20	17
11	3	4	4	5	35	27	62	17	33	0·08	0·07	0·08	0·42	18
2	3	4	6	16	64	46	110	45	44	0·16	0·14	0·15	0·72	19
5	2	2	34	92	134	155	289	67	192	0·56	0·66	0·61	0·67	20
1	...	1	4	2	23	23	46	13	18	0·08	0·09	0·09	0·17	21
9	6	13	15	19	46	43	89	24	49	0·18	0·17	0·18	0·31	22
...	...	...	...	...	4	2	6	3	3	0·02	0·01	0·02	0·23	23
17	11	13	7	14	131	132	263	59	167	0·33	0·41	0·36	0·98	24
17	11	8	6	6	137	143	280	69	169	0·26	0·35	0·30	0·61	25
1	...	...	1	...	12	15	27	4	15	0·04	0·06	0·05	0·28	26
3	2	6	7	6	69	51	120	26	67	0·14	0·13	0·14	0·18	27
3	3	...	5	3	23	17	40	5	17	0·07	0·07	0·07	0·13	28
...	...	...	1	...	2	1	3	...	2	0·01	0·004	0·01	0·12	29
251	165	107	213	380	2,161	1,879	4,040	1,154	2,173	0·19	0·20	0·20	0·32	

ANNUAL FORM

DEATHS REGISTERED FROM FEVERS IN THE DISTRICTS

1	2	3		4		5					
Number.	Districts.	Circles of registration.		Villages.		Mon					
		Number in each district.	Number from which deaths from Fevers were reported.	Number in each district.	Number from which deaths from Fevers were reported.	January.	February.	March.	April.	May.	June.
1	2	3	4	5	6	7	8	9	10	11	12
	AMBALA DIVISION.										
1	Hissar	25	25	960	960	1,601	1,432	1,581	1,960	2,163	2,238
2	Rohtak	20	20	722	722	2,623	2,380	1,251	1,224	1,447	1,637
3	Gurgaon	24	24	1,351	1,253	822	731	810	831	902	1,287
4	Karnal	25	25	1,390	1,390	2,344	1,969	1,770	1,923	2,314	2,723
5	Ambala	19	19	1,715	1,715	650	610	644	708	739	871
6	Simla	3	3	208	203	36	39	41	54	45	50
	JULLUNDUR DIVISION.										
7	Kangra	17	17	711	711	753	911	1,016	1,197	1,505	1,343
8	Hoshiarpur	23	23	2,111	1,839	1,410	1,185	1,358	1,807	2,221	2,006
9	Jullundur	17	17	1,222	1,051	1,434	1,043	1,028	1,292	1,738	1,503
10	Ludhiana	14	14	858	820	1,001	672	670	690	819	1,023
11	Ferozepore	24	24	1,499	1,394	2,219	1,981	1,480	1,667	2,020	1,971
	LAHORE DIVISION.										
12	Lahore ...	30	30	1,121	1,093	2,207	1,450	1,483	1,355	1,479	1,545
13	Amritsar	15	15	1,037	979	1,254	1,008	1,063	1,345	1,870	1,958
14	Gurdaspur	22	22	2,246	2,246	790	676	682	932	1,213	1,047
15	Sialkot	28	28	2,053	1,991	1,487	1,174	1,004	865	1,129	1,027
16	Gujranwala	20	20	1,212	1,212	1,666	1,069	964	716	847	1,149
17	Sheikhupura	20	20	1,214	1,214	1,097	998	734	508	716	674
	RAWALPINDI DIVISION.										
18	Gujrat	17	17	1,436	1,300	1,820	1,463	1,136	448	312	462
19	Shahpur	23	23	986	986	1,312	963	838	666	816	920
20	Jhelum	15	15	888	888	1,228	895	799	648	632	507
21	Rawalpindi	14	14	1,170	1,170	1,735	985	969	985	799	706
22	Attock	14	14	618	618	1,586	1,330	1,097	858	823	663
23	Mianwali	16	16	375	375	932	801	655	538	627	618
	MULTAN DIVISION.										
24	Montgomery	24	24	1,834	1,812	2,465	1,504	1,136	906	1,402	1,211
25	Lyallpur	20	20	973	973	1,420	1,183	1,727	1,303	1,918	1,708
26	Jhang	13	13	981	955	1,353	950	797	812	1,088	1,016
27	Multan	23	23	1,646	1,645	2,460	1,743	1,285	1,419	1,738	1,448
28	Muzaffargarh	24	24	849	695	1,581	1,168	1,068	1,020	1,340	1,359
29	Dera Ghazi Khan	23	23	714	576	1,822	1,513	1,680	1,846	1,899	1,624
	Total ...	572	572	34,099	32,686	42,908	33,836	30,746	30,563	36,461	36,274

No. IX.

OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

						6			7			8	9
						Total.			Ratio of deaths per 1,000 of population.				
July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.	Mean ratio per 1,000 for previous five years.	Number.
14	14	15	16	17	18	19	20	21	22	23	24	25	26
1,629	1,117	1,238	1,562	1,459	1,468	9,733	9,735	19,468	22·35	25·53	23·83	21·18	1
1,063	835	970	1,153	1,341	1,675	9,250	8,349	17,599	22·16	23·53	22·79	18·80	2
805	609	928	1,226	1,107	971	5,793	6,216	11,009	15·75	16·60	16·14	19·74	3
1,890	1,279	1,648	2,336	2,155	2,140	13,205	11,315	24,521	29·11	30·17	29·59	29·65	4
788	540	1,051	1,416	1,056	785	5,171	4,687	9,858	14·32	16·68	15·36	19·24	5
55	50	45	37	37	40	309	220	529	10·83	16·49	12·92	16·51	6
1,062	1,125	1,574	1,390	940	990	7,180	6,626	13,806	18·26	17·83	18·05	23·53	7
1,742	1,500	2,517	2,798	2,133	1,814	11,666	10,730	22,396	23·39	25·03	24·15	20·33	8
1,381	1,195	1,599	1,768	1,791	1,552	8,885	8,439	17,324	19·74	23·22	21·29	17·73	9
922	707	1,150	1,142	1,050	889	5,598	5,137	10,735	17·56	20·65	18·91	15·24	10
1,832	1,188	1,569	2,163	2,208	2,340	11,840	10,768	22,608	19·77	22·41	20·95	16·38	11
1,708	1,396	1,849	2,298	2,574	2,366	11,807	10,403	21,710	17·76	21·67	19·44	16·07	12
1,819	1,724	2,657	2,638	3,143	2,644	12,038	11,085	23,123	23·22	27·04	24·91	19·42	13
1,069	1,007	2,683	3,355	2,572	1,731	9,075	8,682	17,757	19·41	22·83	20·94	16·67	14
966	932	1,922	2,782	2,802	2,157	9,058	9,089	18,147	19·18	22·91	20·88	17·19	15
931	830	859	1,848	1,746	1,883	7,480	7,028	14,508	21·45	25·57	23·27	19·15	16
815	710	626	1,894	1,565	1,589	5,958	5,468	11,426	16·96	19·73	18·18	14·18	17
640	718	1,005	1,483	1,594	1,574	6,554	6,101	12,655	14·94	15·83	15·36	16·89	18
849	627	717	1,238	1,632	2,033	6,521	6,090	12,611	16·63	18·58	17·52	14·16	19
485	488	591	874	1,103	1,087	4,811	4,526	9,337	20·01	19·25	19·63	18·64	20
625	584	774	1,082	1,149	1,220	5,727	5,686	11,413	19·59	22·89	21·11	19·00	21
641	571	675	1,011	1,302	1,563	6,375	5,685	12,060	24·33	23·11	23·74	19·10	22
623	524	642	1,512	1,418	1,713	5,483	5,140	10,623	28·85	30·56	29·66	19·97	23
1,005	970	1,090	1,360	1,799	2,091	8,967	7,972	16,939	22·80	24·88	23·73	15·12	24
1,687	1,214	1,284	1,624	2,395	2,105	9,965	9,603	19,568	19·06	23·24	20·91	14·55	25
970	670	711	1,350	2,074	2,486	7,362	6,915	14,277	24·10	26·09	25·01	13·65	26
1,502	1,043	1,045	1,942	3,214	3,478	11,497	10,820	22,317	23·13	27·08	25·25	16·18	27
970	537	726	1,742	2,633	2,291	8,748	7,687	16,435	28·35	29·58	28·91	25·02	28
1,010	477	480	1,256	2,034	1,807	9,656	7,772	17,428	37·52	36·72	37·16	21·59	29
31,474	25,167	34,625	47,680	52,031	50,422	235,212	216,975	452,187	20·99	23·30	22·04	18·39	

ANNUAL FORM

DEATHS REGISTERED FROM DYSENTERY AND DIARRHŒA IN THE DISTRICTS

1	2	3		4		5					
Number.	Districts.	Circles of registration.		Villages.		Mon					
		Number in each district.	Number from which deaths from Dysentery and Diarrhœa were reported.	Number in each district.	Number from which deaths from Dysentery and Diarrhœa were reported.	January.	February.	March.	April.	May.	June.
1	2	3	4	5	6	7	8	9	10	11	12
	AMBALA DIVISION.										
1	Hissar	25	15	960	119	21	9	18	29	36	15
2	Rohtak	20	20	722	77	6	8	5	11	24	30
3	Gurgaon	24	23	1,351	155	18	12	11	18	34	22
4	Karnal	25	19	1,390	26	9	3	4	16	12	12
5	Ambala	19	19	1,715	139	13	6	15	18	34	31
6	Simla	3	3	208	9	5	1	...	7	4	4
	JULLUNDUR DIVISION.										
7	Kangra	17	17	711	711	82	95	108	140	287	258
8	Hoshiarpur	23	5	2,111	6	2	1	3	1	..	1
9	Jullundur	17	17	1,222	108	29	14	28	40	40	25
10	Ludhiana	14	14	858	76	30	12	25	33	37	16
11	Ferozepore	24	23	1,499	226	26	18	36	54	83	57
	LAHORE DIVISION.										
12	Lahore ...	30	28	1,121	85	47	44	48	81	102	75
13	Amritsar	15	15	1,037	325	28	68	32	44	117	45
14	Gurdaspur	22	22	2,246	299	12	4	20	88	170	68
15	Sialkot	28	24	2,053	175	27	19	28	54	89	55
16	Gujranwala	20	20	1,212	97	29	18	36	42	49	43
17	Sheikhupura	20	18	1,214	232	10	10	22	10	38	17
	RAWALPINDI DIVISION.										
18	Gujrat	17	17	1,436	207	17	10	15	13	12	14
19	Shahpur	23	20	986	65	7	14	7	17	25	9
20	Jhelum	15	15	888	95	5	9	15	21	25	15
21	Rawalpindi	14	13	1,170	375	197	9	8	15	87	113
22	Attock	14	9	618	16	2	...	...	5	6	7
23	Mianwali	16	15	375	57	4	26	29	5	5	1
	MULTAN DIVISION.										
24	Montgomery	24	18	1,834	36	2	2	2	10	8	12
25	Lyallpur	20	19	973	120	4	4	6	8	34	18
26	Jhang	13	13	981	121	18	16	36	19	44	12
27	Multan	23	15	1,645	31	22	11	18	30	19	17
28	Muzaffargarh	24	12	849	19	1	3	4	5	5	4
29	Dera Ghazi Khan ...	23	21	714	20	9	6	11	9	8	10
	Total ...	572	489	34,099	4,027	682	452	590	843	1,428	1,013

No. X.

OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

THS.						6 TOTAL.			7 RATIO OF DEATHS PER 1,000 OF POPULATION.			8	9
July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.	Mean ratio per 1,000 for previous five years.	Number.
13	14	15	16	17	18	19	20	21	22	23	24	25	26
17	27	35	34	14	19	113	155	268	0·26	0·41	0·33	0·43	1
13	16	23	29	25	35	119	106	225	0·29	0·30	0·29	0·33	2
20	32	48	71	29	42	200	157	357	0·54	0·50	0·52	0·47	3
17	13	19	6	9	13	71	62	133	0·16	0·17	0·16	0·24	4
17	30	57	49	44	27	184	157	341	0·51	0·56	0·53	0·68	5
6	1	4	2	5	5	27	17	44	0·98	1·27	1·07	1·67	6
213	178	285	390	319	248	1,342	1,261	2,603	3·41	3·39	3·40	1·42	7
...	1	1	...	...	1	6	5	11	0·01	0·01	0·01	0·03	8
20	29	53	35	26	22	202	169	371	0·45	0·46	0·46	0·35	9
20	30	47	11	23	26	162	148	310	0·51	0·59	0·55	0·46	10
43	55	52	31	39	33	272	255	527	0·45	0·53	0·49	0·27	11
66	108	99	84	85	62	512	389	901	0·80	0·81	0·81	0·52	12
44	46	97	246	84	65	502	414	916	0·97	1·01	0·99	0·39	13
56	77	178	159	130	66	556	472	1,028	1·19	1·24	1·21	1·01	14
41	72	82	89	65	52	387	286	673	0·82	0·72	0·77	0·71	15
28	35	25	32	34	52	254	159	413	0·73	0·58	0·66	0·22	16
49	52	57	17	10	17	181	128	309	0·52	0·46	0·49	0·07	17
26	30	37	38	31	28	167	104	271	0·38	0·27	0·33	0·35	18
7	12	32	18	25	10	93	90	183	0·24	0·27	0·25	0·26	19
15	15	26	16	13	6	109	72	181	0·45	0·31	0·38	0·34	20
12	8	23	32	27	12	293	250	543	1·00	1·01	1·00	3·23	21
3	3	5	2	8	1	24	18	42	0·09	0·07	0·08	0·10	22
9	11	7	14	17	6	77	57	134	0·41	0·34	0·37	0·42	23
2	11	12	12	5	11	59	30	89	0·15	0·09	0·12	0·05	24
19	31	26	17	16	11	103	91	194	0·20	0·22	0·21	0·19	25
16	18	41	35	27	29	191	127	318	0·63	0·45	0·56	0·48	26
27	19	13	17	10	7	105	105	210	0·22	0·26	0·24	0·28	27
1	4	5	10	11	12	37	28	65	0·12	0·11	0·11	0·08	28
4	12	12	18	34	24	93	64	157	0·36	0·30	0·33	0·22	29
811	966	1,401	1,514	1,175	942	6,441	5,376	11,817	0·57	0·58	0·58	0·47	

ANNUAL FORM

DEATHS REGISTERED FROM RESPIRATORY DISEASES IN THE DISTRICTS

1	2	3		4		5					
Number.	Districts.	Circles of registration.		Villages.		Mon					
		Number in each district.	Number from which deaths from Respiratory Diseases were reported.	Number in each district.	Number from which deaths from Respiratory Diseases were reported.	January.	February.	March.	April.	May.	June.
1	2	3	4	5	6	7	8	9	10	11	12
	AMBALA DIVISION.										
1	Hissar	25	22	960	281	127	82	91	101	76	54
2	Rohtak	20	20	722	403	155	164	147	148	123	115
3	Gurgaon	24	24	1,351	404	137	91	87	108	132	121
4	Karnal	25	25	1,390	516	137	159	93	76	61	60
5	Ambala	19	19	1,715	1,715	554	546	578	511	622	867
6	Simla	3	3	208	4	1	...	1	2	4	5
	JULLUNDUR DIVISION.										
7	Kangra	17	17	711	711	203	210	264	259	329	362
8	Hoshiarpur	23	23	2,111	835	204	202	180	159	171	164
9	Jullundur	17	17	1,222	305	193	130	139	118	143	128
10	Ludhiana	14	14	858	378	197	156	160	91	123	95
11	Ferozepore	24	24	1,499	483	122	115	114	94	124	77
	LAHORE DIVISION.										
12	Lahore	30	29	1,121	431	446	418	472	377	311	250
13	Amritsar	15	15	1,037	375	427	283	283	339	344	279
14	Gurdaspur	22	22	2,246	669	695	594	624	689	630	524
15	Sialkot	28	28	2,053	343	215	169	142	128	159	116
16	Gujranwala	20	20	1,212	274	193	162	120	113	99	91
17	Sheikhupura	20	19	1,214	259	34	19	28	12	38	30
	RAWALPINDI DIVISION.										
18	Gujrat	17	17	1,436	952	281	221	192	124	91	83
19	Shahpur	23	18	986	48	8	1	2	9	17	6
20	Jhelum	15	15	888	521	254	209	154	118	82	75
21	Rawalpindi	14	14	1,170	859	484	332	257	172	135	99
22	Attock	14	14	618	201	121	82	96	65	42	55
23	Mianwali	16	16	375	160	34	30	18	17	22	22
	MULTAN DIVISION.										
24	Montgomery	24	20	1,834	103	76	33	24	27	26	17
25	Lyallpur	20	20	973	746	122	120	61	82	94	80
26	Jhang	13	13	981	873	224	144	110	109	94	89
27	Multan	23	22	1,645	205	129	92	95	93	79	63
28	Muzaffargarh	24	20	849	78	22	14	12	4	11	5
29	Dera Ghazi Khan ...	23	21	714	42	80	41	19	23	28	18
	Total ...	572	551	34,099	13,174	5,875	4,819	4,523	4,168	4,210	3,950

No. XI.

OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924

						6			7			8	9
THS.						TOTAL.			RATIO OF DEATHS PER 1,000 OF POPULATION.				
July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males.	Females.	Total.	Mean ratio per 1,000 for previous five years.	Number.
13	14	15	16	17	18	19	20	21	22	23	24	25	26
50	36	45	43	49	92	373	473	846	0·86	1·24	1·04	1·03	1
87	72	59	74	87	148	764	615	1,379	1·83	1·73	1·79	1·28	2
70	60	57	79	108	123	641	532	1,173	1·74	1·69	1·72	1·45	3
55	57	40	55	75	152	580	440	1,020	1·28	1·17	1·23	1·01	4
729	550	613	968	981	952	4,581	3,890	8,471	12·69	13·85	13·20	9·35	5
8	6	4	2	5	2	21	19	40	0·76	1·42	0·98	4·00	6
310	245	385	424	309	283	1,865	1,718	3,583	4·74	4·62	4·69	5·53	7
130	136	186	220	214	240	1,300	906	2,206	2·61	2·11	2·38	2·51	8
114	113	133	172	162	181	975	751	1,726	2·17	2·07	2·12	2·23	9
90	92	90	85	112	152	758	685	1,443	2·38	2·75	2·54	2·38	10
75	67	88	106	113	115	667	543	1,210	1·11	1·13	1·12	1·25	11
216	236	218	222	314	465	2,238	1,667	3,905	3·52	3·47	3·50	2·11	12
250	224	243	584	377	395	2,114	1,914	4,028	4·08	4·67	4·34	3·23	13
589	718	1,106	1,139	911	788	4,896	4,111	9,007	10·47	10·81	10·62	7·30	14
126	114	192	223	242	206	1,156	876	2,032	2·45	2·21	2·34	3·01	15
77	61	81	82	97	227	819	584	1,403	2·35	2·12	2·25	0·82	16
23	26	29	15	17	33	183	121	304	0·52	0·44	0·48	0·29	17
148	130	148	224	199	218	1,170	889	2,059	2·67	2·31	2·50	2·15	18
4	6	7	7	17	33	69	48	117	0·18	0·15	0·16	0·97	19
66	75	61	62	91	113	776	584	1,360	3·23	2·48	2·86	2·25	20
107	75	86	88	118	234	1,223	964	2,187	4·18	3·88	4·04	3·29	21
39	47	38	21	37	72	385	330	715	1·47	1·34	1·41	1·19	22
14	34	29	14	40	19	190	100	290	1·00	0·59	0·81	0·89	23
11	11	13	13	38	43	185	147	332	0·47	0·46	0·47	0·19	24
65	44	64	53	71	108	532	432	964	1·02	1·05	1·03	0·74	25
36	45	48	89	111	134	650	583	1,233	2·13	2·20	2·16	1·43	26
47	40	33	50	98	173	555	437	992	1·14	1·09	1·12	1·14	27
13	11	6	6	28	23	80	75	155	0·26	0·29	0·27	0·27	28
14	5	17	19	30	17	198	110	308	0·77	0·52	0·66	0·42	29
3,557	3,336	4,119	5,139	5,051	5,741	29,944	24,544	54,488	2·67	2·64	2·66	2·19	

ANNUAL FORM

DEATHS REGISTERED FROM PLAGUE IN THE DISTRICTS

1	2	3		4		5					
Number.	Districts.	Circles of registration.		Villages.		Mon					
		Number in each district.	Number from which deaths from Plague were reported.	Number in each district.	Number from which deaths from Plague were reported.	January.	February.	March.	April.	May.	June.
1	2	3	4	5	6	7	8	9	10	11	12
	AMBALA DIVISION.										
1	Hissar	25	6	960	53	28	22	102	306	152	64
2	Rohtak	20	20	722	415	1,021	3,793	12,344	11,996	3,577	340
3	Gurgaon	24	19	1,351	98	52	294	688	683	202	8
4	Karnal	25	17	1,390	182	175	760	1,921	2,484	1,663	221
5	Ambala	19	2	1,715	3	...	...	1	16	19	...
6	Simla	3	...	208	...	...	...	...	...	...	...
	JULLUNDUR DIVISION.										
7	Kangra	17	3	711	3	...	1	...	2	1	...
8	Hoshiarpur	23	8	2,111	10	...	2	3	13	28	...
9	Jullundur	17	7	1,222	15	2	...	25	115	83	13
10	Ludhiana	14	6	858	15	...	...	25	44	71	27
11	Ferozepore	24	18	1,499	28	...	4	121	722	731	221
	LAHORE DIVISION.										
12	Lahore	30	29	1,121	408	319	962	4,120	8,896	5,199	1,417
13	Amritsar	15	15	1,037	258	36	75	612	2,100	2,048	473
14	Gurdaspur	22	17	2,246	579	25	91	434	1,271	957	245
15	Sialkot	28	28	2,053	646	736	1,999	7,308	11,483	6,608	1,385
16	Gujranwala	20	20	1,212	363	616	1,507	5,130	9,016	4,392	1,411
17	Sheikhupura	20	20	1,214	744	179	743	3,282	5,417	6,588	1,377
	RAWALPINDI DIVISION.										
18	Gujrat	17	17	1,436	1,163	404	1,289	9,030	20,069	19,667	10,346
19	Shahpur	23	23	986	184	252	824	2,219	3,593	2,350	882
20	Jhelum	15	15	888	293	94	278	1,070	2,992	3,327	947
21	Rawalpindi	14	12	1,170	380	100	154	108	526	926	778
22	Attock	14	11	618	129	71	81	240	708	1,318	962
23	Mianwali	16	1	375	...	...	..	...	4	...	...
	MULTAN DIVISION.										
24	Montgomery	24	17	1,834	349	168	542	997	889	1,220	377
25	Lyallpur	20	18	973	198	43	216	432	2,923	2,005	707
26	Jhang	13	10	981	10	41	114	129	145	143	68
27	Multan	23	7	1,645	20	2	1	53	56	38	13
28	Muzaffargarh ...	24	2	849	...	...	1	1	...	...	...
29	Dera Ghazi Khan ...	23	1	714	...	...	...	...	...	...	...
	Total ...	572	369	34,099	6,646	4,364	13,753	50,395	86,469	63,313	22,282

No. XII.

OF THE PUNJAB DURING EACH MONTH OF THE YEAR 1924.

						6			7			8	9
ns.						Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous five years.	Number.
July.	August.	September.	October.	November.	December.	Males.	Females.	Total.	Males	Females.	Total		
13	14	15	16	17	18	19	20	21	22	23	24	25	26
5	...	...	46	208	256	640	579	1,219	1·47	1·52	1·49	0·17	1
4	...	1	59	173	331	16,909	16,730	33,639	40·51	47·14	43·56	1·90	2
...	...	21	130	259	828	1,456	1,709	3,165	3·96	5·44	4·64	0·32	3
17	...	...	35	342	558	3,940	4,236	8,176	8·69	11·29	9·87	0·09	4
...	...	...	...	...	...	18	18	36	0·05	0·06	0·06	0·02	5
...	...	...	...	...	...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	3	1	4	0·01	0·002	0·01	...	7
...	...	...	...	2	27	38	37	75	0·08	0·09	0·08	0·02	8
...	...	...	...	...	...	107	131	238	0·24	0·36	0·29	0·12	9
...	...	...	...	...	29	98	98	196	0·31	0·39	0·35	0·03	10
2	...	113	...	2	1	915	1,002	1,917	1·53	2·09	1·78	0·22	11
136	12	...	...	...	60	10,230	10,891	21,121	16·07	22·68	18·91	0·38	12
35	...	...	9	14	17	2,473	2,946	5,419	4·77	7·19	5·84	0·01	13
3	3	2	23	64	186	1,477	1,829	3,306	3·16	4·81	3·90	0·04	14
49	...	...	4	16	60	13,687	15,961	29,648	28·98	40·23	34·12	5·40	15
56	...	...	8	24	42	10,802	11,400	22,202	30·98	41·47	35·60	2·33	16
256	43	40	1	13	22	8,939	9,022	17,961	25·45	32·55	28·58	0·65	17
4,432	...	...	1	...	...	31,217	34,021	65,238	71·18	88·25	79·17	1·40	18
37	...	1	1	...	...	5,040	5,119	10,159	12·85	15·61	14·11	0·95	19
33	...	3	32	17	26	3,917	4,902	8,819	16·29	20·85	18·54	3·06	20
67	15	10	100	84	71	1,357	1,582	2,939	4·64	6·37	5·44	1·59	21
132	1	...	29	76	64	1,724	1,958	3,682	6·58	7·96	7·25	1·38	22
...	...	...	...	...	...	2	2	4	0·01	0·01	0·01	0·02	23
215	164	3	18	7	3	2,288	2,315	4,603	5·82	7·23	6·45	0·46	24
36	...	...	3	12	64	2,892	3,549	6,441	5·53	8·39	6·88	0·81	25
...	...	...	5	10	15	356	314	670	1·17	1·18	1·17	0·10	26
3	...	1	16	83	115	220	161	381	0·45	0·40	0·43	0·26	27
...	...	...	...	...	...	2	...	2	0·01	...	0·003	0·02	28
...	...	...	...	1	...	1	...	1	0·003	...	0·002	0·003	29
5,520	238	195	520	1,407	2,805	120,748	130,513	251,261	10·78	14·01	12·24	0·76	

STATEMENT No. 1.

MONTHLY STATEMENT OF PLAGUE OCCURRENCES IN BRITISH DISTRICTS AND NATIVE STATES IN THE PUNJAB DURING THE YEAR 1924.

Serial No.	Districts and Punjab States.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.		Serial No.	Remarks.
		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	Hissar ...	39	28	28	22	100	102	414	306	352	152	6	64	...	5	...	...	...	...	58	46	274	208	381	286	1,712	1,319	1	
2	Rohtak ...	1,109	1,021	4,431	3,793	13,931	12,344	12,481	11,936	3,668	3,577	380	340	5	4	...	..	1	1	72	59	213	173	354	331	36,645	33,639	2	
3	Gurgaon ...	34	52	238	294	847	688	759	653	261	202	55	8	...	...	...	...	23	21	177	130	295	259	1,017	828	3,706	3,165	3	
4	Karnal ...	409	175	998	760	2,599	1,921	2,250	2,484	1,520	1,663	302	221	4	17	...	...	...	..	43	35	350	342	6 9	553	9,144	8,176	4	
5	Ambala ...	...	...	...	...	1	1	44	16	22	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	67	36	5	
6	Simla ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	..	..	...	...	...	...	6	
7	Kangra ...	...	...	1	1	1	...	6	2	...	1	...	...	...	...	...	...	...	...	...	...	..	...	...	...	8	4	7	
8	Hoshiarpur ...	...	...	3	2	3	3	17	13	34	23	...	...	...	...	...	...	...	...	...	..	13	2	71	27	141	75	8	
9	Jullundur ...	4	2	...	...	53	25	220	115	141	83	3	13	...	...	...	...	...	...	...	..	...	...	...	..	421	238	9	
10	Ludhiana ...	...	...	...	...	36	25	80	44	71	71	27	27	...	..	...	...	...	...	...	...	...	...	29	29	243	196	10	
11	Ferozepore ...	...	...	4	4	122	121	730	722	752	731	221	221	2	2	...	..	113	113	...	..	2	2	4	1	1,953	1,917	11	
12	Lahore ...	420	319	1,272	952	6,447	4,120	11,507	8,896	7,617	5,199	2,122	1,417	270	136	21	12	...	...	...	..	...	...	80	60	29,756	21,121	12	
13	Amritsar ...	72	36	153	75	901	612	2,541	2 100	2,928	2,048	1,760	473	61	35	..	..	...	..	17	9	24	14	41	17	8,498	5,419	13	
14	Gurdaspur ...	30	25	150	91	591	434	1,371	1,271	2,226	957	300	245	6	5	3	3	3	2	31	23	74	64	231	186	5,086	3,306	14	
15	Sialkot ...	963	736	2,294	1,999	7,486	7,308	11,799	11 483	6,680	6,603	1,458	1,385	...	49	..	..	...	...	18	4	30	16	80	60	30,868	29,648	15	
16	Gujranwala ...	777	616	1,637	1.507	5,286	5,130	9,277	9,016	4,532	4,392	1,521	1,411	...	56	...	...	...	...	13	8	50	24	53	42	23,146	22,202	16	
17	Sheikhupura ...	270	179	768	743	3,307	3,282	5,442	5,417	6,671	6,538	1,429	1,377	306	253	93	43	115	40	26	1	153	13	72	22	18,652	17,961	17	
18	Gujrat ...	154	404	706	1,289	2,880	9,030	7,090	20,069	12,955	19,667	2,334	10,346	127	4432	..	..	...	..	1	1	1	..	...	...	*26,248	65,238	18	
19	Shahpur ...	300	252	862	824	2,280	2,219	3,672	3,593	2,393	2,350	929	882	...	37	...	...	...	1	...	1	...	...	...	...	10,441	10,159	19	
20	Jhelum ...	68	94	165	278	1,364	1,070	3,714	2,992	4.594	3,327	1,284	917	18	33	..	..	3	3	45	32	33	17	89	24	11,380	8,319	20	
21	Rawalpindi ...	144	100	200	154	191	108	800	526	1,310	926	1,124	778	100	67	25	15	15	10	168	100	132	84	120	71	4,329	2,939	21	
22	Attock ...	100	71	103	81	332	240	1,018	703	1,676	1,318	1,235	962	175	142	3	1	1	...	51	29	105	76	92	64	4,891	3,632	22	
23	Mianwali ...	...	...	...	...	...	...	5	4	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	5	4	23	
24	Montgomery ...	180	162	550	542	990	907	897	889	1,231	1,230	882	377	227	215	171	164	20	3	25	18	12	7	5	3	4,690	4,663	24	
25	Lyallpur ...	60	43	405	216	417	432	4,015	2,723	4,121	2,005	1,517	707	58	36	...	...	...	..	5	3	11	12	90	64	10,699	6,441	25	
26	Jhang ...	60	41	145	114	130	129	187	145	180	143	69	68	...	...	...	...	...	...	20	5	35	10	59	15	885	670	26	
27	Multan ...	9	2	6	1	78	53	55	56	93	38	15	13	...	3	...	...	2	1	86	16	133	83	204	115	681	381	27	
28	Muzaffargarh...	...	..	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	28	
29	Dera Gazi Khan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	29	
	Total British Districts.	5,202	4,364	15,120	13,753	50,434	50,395	80,391	86,469	66,103	63,313	18,473	22,282	1,359	5,520	416	238	296	195	856	520	1,944	1,407	3,741	2,805	244,235	251,261		
1	Patiala ...	...	...	...	...	106	55	383	386	104	99	76	44	...	...	...	..	...	...	177	177	300	239	290	197	1,436	1,177	1	
2	Bahawalpur ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	2	
3	Jind ...	591	438	1,484	984	2,542	1,637	2,220	1,596	552	407	49	45	...	...	...	...	8	6	133	87	143	85	219	135	7,941	5,400	3	
4	Nabha ...	...	...	23	23	18	16	57	38	28	23	10	3	...	...	...	...	...	...	...	...	10	5	...	...	146	108	4	
5	Kapurthala ...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	
6	Sirmur (Nahan)	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	
7	Maler Kotla ...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	
8	Faridkot ...	...	...	...	...	51	19	175	140	202	148	...	...	...	...	...	...	...	...	...	...	...	...	...	...	428	307	8	
9	Pataudi ...	...	...	6	4	129	79	66	35	12	11	...	...	...	...	...	...	...	...	22	11	104	57	124	64	463	261	9	
10	Chamba ...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	
11	Kalsia ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	
12	Dujana ...	6	2	124	110	445	319	345	305	..	...	...	...	...	...	...	...	...	...	18	13	71	34	10	13	1,019	796	12	
13	Bilaspur ...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	...	...	..	...	...	...	...	...	...	...	...	13	
	Total Punjab States.	597	440	1,637	1,101	3,291	2,125	3,246	2,480	898	688	135	92	...	...	...	...	8	6	350	288	628	420	643	409	11,433	8,049		
	Grand Total...	5,799	4,804	16,757	14,854	53,725	52,520	83,637	88,949	67,001	64,001	18,608	22,374	1,359	5,520	316	238	304	201	1,206	808	2,572	1,827	4,384	3,214	255,668	259,310		