

Mysore Health Department Bulletin No. 2.

REPORT
ON
TUBERCULOSIS IN THE MYSORE STATE

BY
DR. P. S. CHANDRASEKAR, M.D.
Officer in charge of Tuberculosis Survey in Mysore.



BANGALORE:
PRINTED AT THE GOVERNMENT PRESS
1928

PRICE ONE RUPEE

DR. P. S. CHANDRASEKAR'S REPORT ON TUBERCULOSIS IN THE MYSORE STATE.

In Government Order No. C. 11-36—Med. 43-27-5, dated Camp, Mysore, the 9th October 1927; the Government of His Highness the Maharaja of Mysore considered it necessary to organize an efficient Tuberculosis Service in the State, as they had reason to think that Tuberculosis prevails in Mysore to a large extent and is causing considerable loss of life. But before doing so, they desired to have a preliminary investigation of the conditions prevalent in the State in regard to Tuberculosis with special reference to the following points:—

- (1) The prevalence and distribution of the disease;
- (2) The existing facilities for diagnosis and treatment;
- (3) The extent to which the existing Medical Staff and institutions could be utilized in Tuberculosis work; and
- (4) The climatic conditions of the localities, which can be selected for carrying on the different lines of treatment.

The work was entrusted to me and I entered on my duties on the 22nd of October 1927.

Immediately after assuming charge of my office, I interviewed various medical officers of the State, retired Sanitary Commissioners and retired Provincial Officers of considerable experience, who had toured round the whole State in various capacities and had an intimate knowledge of the conditions of the State. I had many valuable suggestions from them on various points.

I have toured round the State and have visited all the District Hospitals (Tumkur, Kolar, Hassan, Kolar Gold Fields, Chitaldrug, Kadur and Shimoga), the bigger hospitals in Mysore and Bangalore; the Municipal Dispensaries and the Epidemic Disease Hospitals of the cities of Bangalore and Mysore and about a dozen mofussil dispensaries and hospitals selected at random, *e.g.*, at Yelahanka, Doddballapur, Srinivasapur, Chintamani, Challakere, Davangere, Belur, Channarayapatna, Sakrepatna, Honnali, Sagar, Saklespur and Arkalgud.

These visits also gave me an opportunity to examine the house conditions under which the people lived in these towns and the villages *en route*, *e.g.*, Dandiganahalli, Grama, Belavi, Talavatta, etc.

I have also visited Nandi Hills in Bangalore, Chamundi Hill in Mysore, Devarayadurg in Tumkur and Jogimuradi or Jogimutti in Chitaldrug to find out the suitability of these places for locating a hill station or solarium for the treatment of Surgical Tuberculosis.

The visits to Hassan town and its suburbs, Hagare, Channarayapatna, Srinivasapur, Challakere and Tumkur and its suburbs were specially made to ascertain the suitability of these places for locating a Tuberculosis Settlement.

Tuberculosis is a very common disease and is distributed over the whole of the civilised world. It is a disease of all times and of all countries. No race is exempt from the ravages of the disease and no country is exempt. No climate confers immunity against tuberculosis. It is prevalent in all latitudes and altitudes. It is known to occur in all regions whether dry or moist, high or low, warm or cold. The comparative infrequency at high altitudes is easily explained by the sparseness of the population. To secure immunity from Tuberculosis, it is not altogether material where one lives, but, in what manner. Dwellings which are crowded and poorly lighted and ventilated are the main sources of infection and form the chief danger to the poor in large cities. The frequency of the disease is determined more by overcrowding, poverty, occupation and neglect of the laws of health than by geographical situation.

Tuberculosis is responsible for at least 1/13th of the world's death rate. The rate of mortality for tuberculosis for the whole civilised world is about 1 in 13 or

7½ per cent. The rate for the whole of India, as calculated from the annual reports of the Oriental Life Assurance Company of Bombay (which has got dealings all over India), is 1 in 11 or 9 per cent (practically the same as for England and Wales).

My friends in Bombay, Calcutta and the United Provinces have told me that the disease is very prevalent in Bombay, Bengal and the United Provinces. I mention these facts just to give some rough idea of the prevalence of tuberculosis throughout India quite as much as in other parts of the civilised world.

Mysore State is a miniature India and presents every kind of variation in climate met with in India. It is surrounded by the British Districts of Malabar, South Canara, North Canara, Dharwar, Bellary, Ananthapur, Cuddapah, North Arcot, Chittoor, Salem, Coimbatore and Nilgiris, which are districts in which the disease has been found to be fairly common.

As regards Dharwar and North Canara, I have no information. But, as regards the Madras Districts, I may say that tuberculosis is fairly prevalent in them all. Taking the figures for the admission of cases of tuberculosis in the Hospitals of the Madras Presidency for the year 1926, the districts can be arranged in the following order as regards the prevalence of the disease :—

- | | |
|--|--|
| 1. Madras. (Contributes the largest number of cases). (May include imported patients.) | 14. <i>South Canara and Coimbatore.</i> |
| 2. <i>Malabar</i> comes next. | 15. <i>North Arcot.</i> |
| 3. Tanjore. | 16. Kistna. |
| 4. Trichinopoly. | 17. <i>Bellary</i> (13th if an average of 10 years be taken). |
| 5. Guntur. | 18. <i>Salem.</i> |
| 6. <i>Cuddapah.</i> | 19. Vizagapatam. |
| 7. Tinnevely. | 20. Ramnad. |
| 8. Godavari East. | 21. South Arcot. |
| 9. Madura. | 22. Anantapur. |
| 10. Kurnool. | 23. Godavari West. |
| 11. <i>Chittoor.</i> | 24. Ganjam. |
| 12. Chinglepet. | 25. <i>Nilgiris</i> (14th if an average of 10 years be taken). |
| 13. Nellore. | 26. <i>Vizagapatam Agency.</i> |

N.B.—The italicised districts surround Mysore.

Of course the position in the list of each district may vary slightly from year to year. The table brings out the fact that Tuberculosis is fairly prevalent all round the Mysore State.

The habits and customs of the Mysoreans do not seem to differ much from those of the Madrasis in the neighbouring British Districts. Being surrounded by districts where Tuberculosis is fairly prevalent and being inhabited by people who are of very nearly the same habits and customs as the British Indians all round, there is no reason why Mysore should be exempt from tuberculosis. I started on my enquiry with the presumption that Tuberculosis was prevalent in Mysore quite as much as in the neighbouring Madras Districts. But, when I talked over this matter with my Mysore friends, both professional and laymen, I was told by some that tuberculosis was not very prevalent in this State except in Bangalore and Mysore Cities. I was surprised to hear the statement and I desired to have some exact information. I was inclined to think that the cases of tuberculosis could not have been properly diagnosed and that the registration of deaths must have been imperfect.

The prevalence of the disease can be gauged from—

- (1) The death returns of the various towns and villages, as summed up in the Annual District Board Reports and the Sanitary Commissioner's reports ;
- (2) The Hospital Admission Returns, and
- (3) The general impression of the medical men.

The Mortality Returns sent up to the Sanitary Commissioner through the District Boards are said to be extremely unreliable in this State by the District Medical Officers, by the Deputy Commissioners and by Dr. Karve, the Deputy Sanitary Commissioner.

I am informed that the statistics are reliable only in the case of Bangalore, Mysore and Kolar Gold Fields, which are Cities lucky enough to have separate Health Officers to look after the sanitation.

It is impossible to gain any information from the Sanitary Commissioner's reports. Even if the figures be reliable, no information can be obtained from these reports, as there is no separate heading for "Tuberculosis" in the Sanitary Commissioner's reports and in the forms in which the Patels, etc., are expected to furnish the death returns. As the Patels are said to be ignorant and careless, the information given by them cannot be relied upon to any great extent. But all the blame should not be thrown on the shoulders of the Patels. There is no column for "Tuberculosis" in the death returns, though there are columns for Snake-bites, Suicide, etc. The Sanitary Commissioner's reports are thus of no help for our purpose. Tuberculosis is included under "All other causes." The District Board reports give plenty of information about the fines collected from cattle pounds and toll-gate collections, but no information on the toll of death from tuberculosis. I am informed that a new form has been prescribed for use from the 1st July last and that some kind of figures would be available in the future years. In Bangalore City, the system of registration of births and deaths by the various Medical Officers in charge of the Municipal Dispensaries is fairly satisfactory. The Medical Officers may be expected to make enquiries, in order to satisfy themselves as to the cause of death. We might obtain at least 'less unreliable' (even if not very reliable) reports than at present.

It would be highly desirable to copy the Bangalore plan and make the Medical Officers throughout the Province responsible for the registration of births and deaths at least in their jurisdiction—say five miles round their dispensaries.

As regards the places, which cannot be easily reached by the Medical Officers in charge of the mofussil dispensaries, some effective method of registration would have to be devised at an early date. The Medical Officer in charge of the dispensaries can be expected to go round only a small number of villages and I presume that a number of villages in each taluk are left unprovided for, in the matter of medical relief. If Sub-Assistant Surgeons can be provided to travel round these villages, left at present without medical relief, once in a fortnight at least, with medicines for distribution, preferably through trained village school-masters, they can provide some amount of medical relief and also supervise and check birth and death reports.

The system of registration throughout the State requires immediate re-organisation, as all sanitary measures are based on the information derived from "Vital Statistics."

As regards the second source of information, the Hospital Admission Registers, the reports from the Medical Officers would certainly be more reliable than the death returns.

I sent a questionnaire to all the medical men in charge of medical institutions, through the Sanitary Commissioner's Office. Some of the officers could not furnish any information and many reports were received marked "nil." But the detailed reports that have been received give much interesting information.

The men attached to the various Hospitals and Dispensaries in the State were requested to supply through the Sanitary Commissioner's Office some information about the incidence of tuberculosis in the Province, deaths from tuberculosis in the State and about their general impression, in the forms given below.

STATEMENT A I.

Extracted from the Admission Register of 1926 of the Out-Patient
Dispensary at.....

Cases of Consumption (or Tuberculosis of the lung) treated.

Month	Name of patient	Age	Sex	Caste	Town or village where resident

STATEMENT A II.

Extracted from the Admission Register of 1926 of the Out-Patient Dispensary at.....

Cases of "Other tubercular" diseases, *i.e.*, Tuberculosis of Bones, Joints, Glands, etc.

Month	Name of patient	Age	Sex	Caste	Town or village where resident

STATEMENT D.

Extracted from the Death Register of 1926 of the Out-Patient Dispensary at.....

Deaths from Consumption or Tuberculosis during the year 1926.

Date of death	Name of patient	Age	Sex	Address

STATEMENT E.

Personal impressions of the Medical Officer of the Out-Patient Dispensary at.....about the prevalence of Tuberculosis.

1. The Taluks where the Officer has worked.
2. Personal Impression as regards :—
 - (a) The prevalence of Tuberculosis in the taluks served.
 - (b) The community or caste most affected.
 - (c) The sex more affected.
 - (d) The age period during which the disease is most fatal and common.
3. The signs and symptoms considered diagnostic in routine, rapid diagnosis, in out-patient practice.

The replies received only confirm my original suspicion that the disease is not properly diagnosed in the great majority of cases. Most of the medical men depend on the later signs of the disease (found in the advanced stages) for the purpose of diagnosis. Under the existing conditions in the overcrowded out-patient departments, medical men do not find the necessary time to go into details and search for the earlier suspicious signs and symptoms of tuberculosis. So, they satisfy themselves with diagnosing only the more advanced stages of the disease. It will thus be seen that the great majority of cases are actually missed. The majority of the medical men have not yet recognised the possibility of the wide prevalence of tuberculosis in this State; and hence, their minds are not open to entertain the idea of "Tuberculosis." They are "mind-blind" to Tuberculosis. In this State, we must also remember that medical men are naturally obsessed with the idea of Malaria in every case of fever, as the State is notorious for Malaria. Many of them (Medical men) require Post-Graduate instruction in the methods of early diagnosis and treatment of tuberculosis, in order to enable them to recognise the early stages of the disease. Most of us are "Visuals" in the language of Dr. Robert Hutchinson; and we must have once seen a thing before we can recognise it again. Facilities should be given to the medical men to see the earlier and curable stages of the disease. As in Madras, many cases in this State pass muster under Malaria, Bronchitis, Influenza, Neurasthenia, Dyspepsia, P. U. O., and "all other respiratory diseases." As a matter of fact, one medical man told me that he had not come across Tuberculosis in his town and that he met with only Malaria complicated with Bronchitis. A very intelligent Medical Officer showed me a suspicious

case, which was being treated for Malaria ; but was really tuberculosis. In another place, where the medical man was treating a patient for simple fever, I was able to demonstrate to the satisfaction of the medical men that the disease was really a late case of tuberculosis. In another place, the medical man told me that tuberculosis was very uncommon in his place, but I found during my inspection that he himself had correctly diagnosed and was treating half a dozen cases of tuberculosis at the time of my visit. Evidently, his idea of the prevalence of the disease and mine differ a good deal. In another place, the medical man told me that tuberculosis was uncommon in his place. But when he took me round to see his private cases, I saw 4 cases within 2 furlongs. In another place, where the villagers denied the existence of tuberculosis in their village, I was able to detect a bad case and demonstrate it to the Medical Officer who accompanied me. In another place, where the disease was not supposed to prevail (in Malnad), I saw a case of Malaria complicated with Tuberculosis. Yet in another place, where the disease was said to be scarce, considerable number of cases have since been reported, as having been treated during 1926 in the Hospital. Many deaths from Tuberculosis during 1926 have also been reported from the same place.

Many medical men state that the disease does not prevail in the Malnad. Probably, the disease is not as frequent as in the bigger towns, but it certainly does prevail in Malnad also. Cases of Tuberculosis have been reported by the Medical Officers serving in Malnad from 16 stations in the Kadur District, 14 stations in the Shimoga District and 5 stations from the western half of Hassan District.

The General Impressions of the Medical Officers:—Though 222 reports were expected, only 146 reports were received of which only 110 were serviceable and contained any information. Of the 110 Officers, who replied, 40 could offer no definite information and would not commit themselves. Almost all of them were Sub-Assistant Surgeons.

Four Medical Officers consider the disease as not frequently occurring in the State; sixty consider the disease as fairly prevalent; and six consider the disease as very prevalent. Most of them consider that the disease is met with in towns and cities more frequently than in rural parts.

As regards the *sex*, almost everybody considers the disease to be much more prevalent amongst women than men.

As regards the *age* of incidence, most of them are agreed that the disease is most frequently met with between 15 and 35 years.

As regards the *community* specially attacked, many of them draw special attention to the fact that the Mussalmans (especially women) are more frequently attacked than the other communities.

As regards the Hindus, the Brahmins, Lingayets, Voddars, Mahrattas and Saraswats seem to be more affected than other castes. Some Medical Officers in Shimoga and Kolar draw attention to the fact that the imported population of coolies suffer more from the disease than the indigenous people. The Malnad Officers seem to think that the indigenous residents of the Malnad population are not particularly subjected to the disease.

Though agriculturists suffering from Tuberculosis have been admitted in the hospitals and dispensaries of the State, I have not come in contact personally with such cases except in one or two instances. As a class, the raiyats seem to be more immune than the urban population. Though the house conditions are very deplorable, most of the men and women spend the greater part of the day in work in the open fields and thus live unintentionally a sort of sanatorium life.

As regards the *signs and symptoms considered diagnostic* of the disease, the majority of the Medical men go by the late signs and symptoms. The disease is evidently diagnosed by them only a few months before death. Forty-two out of 110 have got very confused notions about the diagnostic signs. Only about 20 per cent of them seem to diagnose the disease fairly early. Very few of them seem to diagnose the disease in the very early stages. But this is a peculiarity not confined to our local doctors. The general practitioners even in other parts of the world who have not had the benefit of a post-graduate training in Tuberculosis work miss the diagnosis. Even in America, where the Tuberculosis work is carried on at a very high level, at the present time, experts have regretted that many a general practitioner fails to make a correct diagnosis, and by negligence or carelessness allows a case, with an excellent opportunity of arrest and return to normal life,

progress to a far advanced stage. They complain that "there is something radically wrong when a very large percentage of men in the practice of medicine are unable to recognise, not only in its incipency but also even in the much advanced stages, *the most common disease on the face of the earth to-day*. Why this state of affairs should exist is unaccountable and it must be put down in a great many cases to nothing more than carelessness." This complaint holds good in Mysore as well as in the other parts of India. The failure to make a correct diagnosis is due to a variety of causes. First and foremost, the medical men have got absolutely no time in a crowded out-patient dispensary to make a thorough examination of the patients. Secondly, the medical men do require a certain amount of post-graduate training in the modern methods of diagnosis of Tuberculosis, as they have not seen, as a rule, cases in the very early stages in the general Hospitals, during their student period. Thirdly, the knowledge in medicine of a number of medical men in this country (Southern India) may be said to be the final-year-student's knowledge of medicine. In this country, unfortunately, people have got no studious habits and do not keep up with the recent advances in medicine in various directions. To make the medical men more efficient in the diagnosis of such an extremely common disease in the early stages, it is absolutely essential that they should have post-graduate training in Tuberculosis work. This point will be considered in detail later on in the report.

A. PREVALENCE OF TUBERCULOSIS IN MYSORE.

Prevalence of Pulmonary Tuberculosis or consumption.—Detailed reports on this point were available from 89 stations. Reports in which no information was given were received from 54 stations. The forms were simply marked "Nil." Reports were not received from 79 stations.

Other forms of Tuberculosis, i.e., Surgical Tuberculosis.—Detailed reports on this point were available from 64 stations. Reports giving no information but simply marked "Nil," were received from 89 stations. Reports were not received from 69 stations.

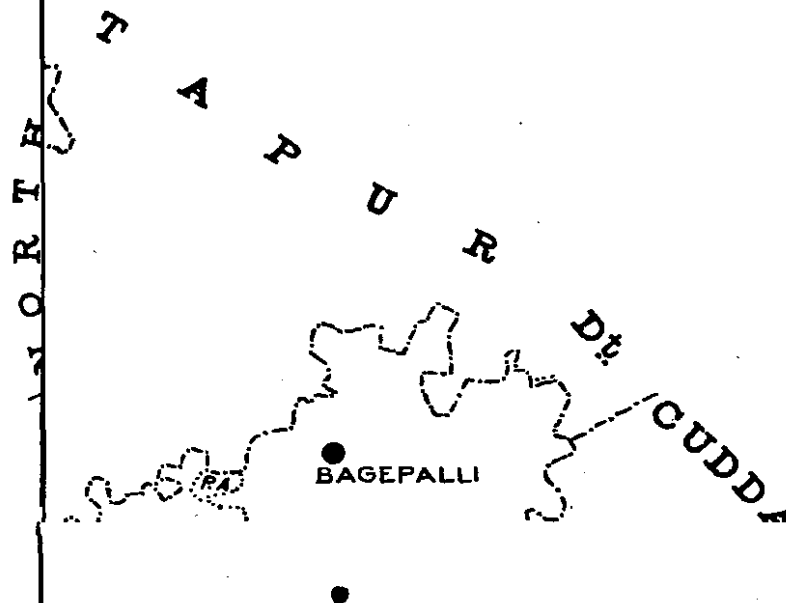
The analysis of the information contained in these reports is very interesting.

Cases of Tubercular patients who are admitted and treated and cases of those who had died from Tuberculosis have been reported from every taluk in the State. Tuberculosis has been detected in the extreme North:—in Jagalur, Molakalmuru, Davangere and Harihar; in the extreme East:—in Bagepalli, Srinivasapur, Mulbagal and Kolar Gold Fields; in the extreme South:—in Gundlupet, and Heggaddevankote and in the extreme West:—in Nagar, Sagar and Sorab. It has also been reported from Tumkur in the centre of the State. Tuberculosis has been found to prevail in the Maidan as well as in the Malnad. Cases of Tuberculosis have been reported in Kalasa, Sringeri, Tirthahally, Nagar etc., on the west, where the rainfall is 100" and over in the year. They have also been reported from places like Chitaldrug, Challakere, Bagepalli, Sira, etc., where the rainfall is under 25" in the year. They have also been reported from places like Belur, Seringapatam, Mandya, Bangalore and Mysore, where the rainfall ranges from 25" to 40". They have been reported from hot places like Kolar and Chitaldrug and they have also been reported from cold damp places, in Shimoga and Kadur Districts. They have been reported amongst the civil population as well as amongst the sepoys. They have been reported amongst men inside the Jails as well as amongst men outside the Jails. They have been reported amongst the insane men in the Lunatic Asylum as well as amongst the sane men outside. Cases of Tuberculosis have been reported in all communities, in both sexes, in all ages and in a variety of occupations, as might be seen from the lists appended. People leading an open out-door life like agriculturists and gardeners have also not been entirely immune. Students, clerks and professional men and even raiyats have been found to suffer from the disease.

As a matter of fact, no taluk in the State has been exempt. The disease has been found in towns as well as in villages. No part of the State, no community, no sex, no profession, is exempt from the disease. The richer and the middle classes have suffered quite as much as (probably more than) the poor from Tuberculosis. The accompanying list gives the places from which cases have been reported so far. By searching for a longer time and by making more domiciliary visits, I am sure the list can be increased considerably in size.

SPOT MAP OF THE MYSORE STATE

showing the places in the various taluks
where Tuberculosis was found to exist
during the recent preliminary survey.
The places are indicated by red spots.



Tuberculosis Found Districtwar.**BANGALORE DISTRICT.**

- | | |
|------------------------------------|------------------------------------|
| 1. Anekal. | 11. Hebbal (Bangalore Taluk). |
| 2. Bangalore. | 12. Hosahally (Dodballapur Taluk). |
| 3. Channapatna. | 13. Nilsandra. |
| 4. Devanhalli. | 14. Sarjapur (Anekal Taluk). |
| 5. Dodballapur. | 15. Settyhalli (Bangalore Taluk). |
| 6. Hoskote. | 16. Sulur (Solur). |
| 7. Kankanhalli. | 17. Thyamagondalu. |
| 8. Magadi. | 18. Vartur (Bangalore Taluk). |
| 9. Nelamangala. | 19. Yelahanka (Bangalore Taluk). |
| 10. Closepet. (Channapatna Taluk). | |

KOLAR DISTRICT.

- | | |
|-------------------|---------------------------------|
| 1. Bagepalli. | 9. Sidlaghatta. |
| 2. Bowringpet. | 10. Srinivasapur. |
| 3. Chickballapur. | 11. Attipur (Goribidnur Taluk). |
| 4. Chintamani. | 12. Bukkambudhi. |
| 5. Goribidnur. | 13. Devaraysamudram. |
| 6. Kolar. | 14. Gudibanda. |
| 7. Mulbagal. | 15. Kolar Gold Fields. |
| 8. Malur. | 16. Nandiyanur. |

TUMKUR DISTRICT.

- | | |
|------------------------------|-------------------------------------|
| 1. Chiknayakanhalli. | 11. Chikdasanahalli. |
| 2. Gubbi. | 12. Honnavalli. |
| 3. Kunigal. | 13. Huliur. |
| 4. Madhugiri. | 14. Koratagere. |
| 5. Pavagada. | 15. Kyatsandra. |
| 6. Sira. | 16. Kuppur. |
| 7. Tiptur. | 17. Kadagattoor (Madhugiri Taluk). |
| 8. Tumkur. | 18. Turuvekere. |
| 9. Brunahally. (Sira Taluk). | 19. Virupasamudra (Pavagada Taluk). |
| 10. Bellavi. | |

MYSORE DISTRICT.

- | | |
|---------------------|------------------------|
| 1. Chamarajnagar. | 14. Yelandoor Jahgir. |
| 2. Gundlupet. | 15. Bannur. |
| 3. Heggaddevankote. | 16. Bettadapura. |
| 4. Hunsur. | 17. French Rocks. |
| 5. Krishnarajpet. | 18. Kagalwady. |
| 6. Malvalli. | 19. Krishnarajasagara. |
| 7. Mandya. | 20. Maddur. |
| 8. Mysore. | 21. Melkote. |
| 9. Nagamangala. | 22. Nettukal Village. |
| 10. Nanjangud. | 23. Nisana. |
| 11. Seringapatam. | 24. Periyapatna. |
| 12. T.-Narsipur. | 25. Sivasamudram. |
| 13. Yedatore. | |

HASSAN DISTRICT.

- | | |
|---------------------|--------------------------|
| 1. Arkalgud. | 9. Grama. |
| 2. Arsikere. | 10. Hirisave. |
| 3. Belur. | 11. Kolhalli. |
| 4. Channarayapatna. | 12. Konanur (Saklespur). |
| 5. Hassan. | 13. Saklespur. |
| 6. Hole-Narsipur. | 14. Sukravarasanthe. |
| 7. Manjarabad. | 15. Yeslurpet. |
| 8. Arehalli. | |

KADUR DISTRICT.

- | | |
|-------------------|------------------------|
| 1. Bale-Honnur. | 13. Handy. |
| 2. Chikmagalur. | 14. Havally. |
| 3. Kadur. | 15. Hariharapur. |
| 4. Koppa. | 16. Hosahally. |
| 5. Sringeri. | 17. Kalasa. |
| 6. Mudigere. | 18. Kaisgodanhalla. |
| 7. Tarikere. | 19. Kuradikan Estate. |
| 8. Aldur. | 20. Lakkavalli. |
| 9. Bidare. | 21. Narasimharajapura. |
| 10. Basrikatte. | 22. Kattigade Village. |
| 11. Birur. | 23. Sollebile. |
| 12. Doddanagudda. | 24. Sakrepatna. |

SHIMOGA DISTRICT.

- | | |
|------------------|----------------------------|
| 1. Channagiri. | 13. Kudlige. |
| 2. Honnali. | 14. Kumsi. |
| 3. Nagar. | 15. Mandagadde. |
| 4. Sagar. | 16. Male-bennur. |
| 5. Shikarpur. | 17. Megaravally. |
| 6. Shimoga. | 18. Nittoor (Sagar Taluk). |
| 7. Sorab. | 19. Sanne-Koppa. |
| 8. Tirthahalli. | 20. Santhebennur. |
| 9. Anavatti. | 21. Shiralkoppa. |
| 10. Bhadravati. | 22. Soolygudu. |
| 11. Charkada. | 23. Talavatta. |
| 12. Kallurkatte. | |

CHITALDRUG DISTRICT.

- | | |
|----------------|------------------|
| 1. Challakere. | 7. Molakalmuru. |
| 2. Chitaldrug. | 8. Bharmasagara. |
| 3. Davangere. | 9. Harihar. |
| 4. Hiriya. | 10. Gulibalu. |
| 5. Holalkere. | 11. Rayadurga. |
| 6. Jagalur. | |

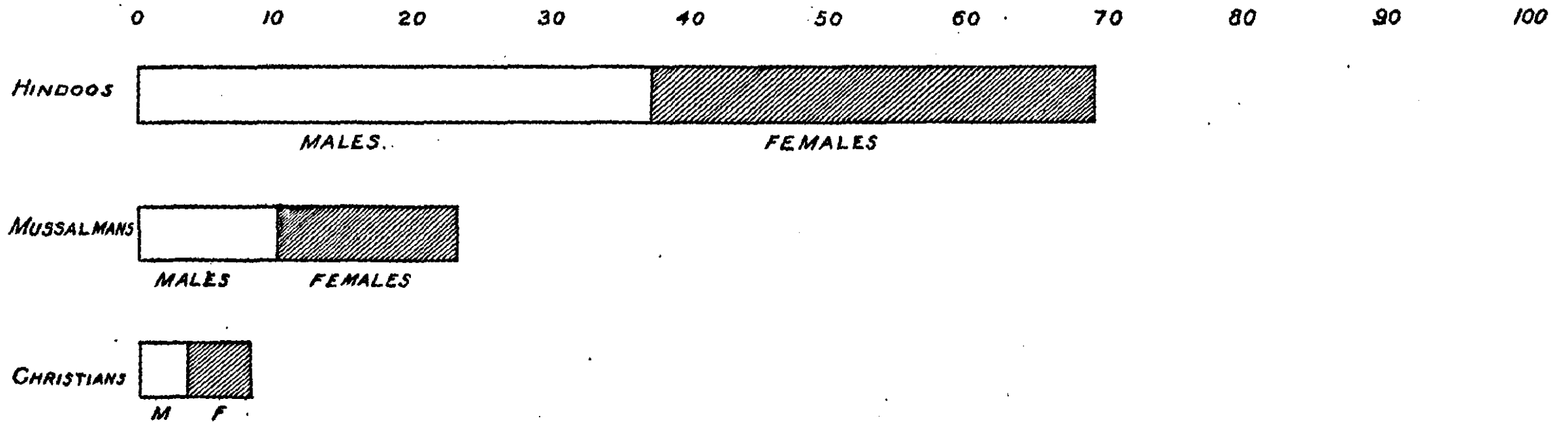
List of Castes which contribute to the army of T. B. (Tuberculous Patients).

- | | |
|-----------------------|--------------------------------|
| Kuruba and Cambaliga. | Namadhari. |
| Panchala. | Kumbara. |
| Arsu. | Gangadikar. |
| Banajiga. | Nayakar. |
| " Setty. | Lada (Mahratta Trader). |
| " Trader. | Rajput. |
| Vellala. | Mudaliar. |
| Bestar. | Sivachar. |
| Brahmin. | Mahratta. |
| Hebbar Brahmin. | Vaisya. |
| Mandyam Brahmin. | Catholic (Christian). |
| Saraswat Brahmin. | Protestant (Christian). |
| Havika Brahmin. | Anglo-Indian. |
| Devanga. | Gollar. |
| Dhobi. | Kunchigar. |
| Lingayet. | Mussalmans. |
| Ganigar. | Adi-Dravida and Adi-Karnataka. |
| Tigalar. | Naidu. |
| Vokkaliga. | Singh. |
| Sada Vokkaliga. | Kshatriya. |

List of Occupations which have contributed to the army of T. B.

- | | |
|----------------|--------------------|
| Milkman. | Railway Guard. |
| Butler. | Motor Driver. |
| Cook. | Sepoy. |
| Weaver. | Constable |
| Tailor. | Sanitary Overseer. |
| Potter. | Excise Inspector. |
| Cobbler. | Actor. |
| Carpenter. | Compositor. |
| Goldsmith. | Student. |
| Barber. | Teacher. |
| Dhobi. | Clerk. |
| Miner. | Lawyer. |
| Cooly. | Medical Student. |
| Mason. | Doctor. |
| Sweeper. | Nurse. |
| Peon. | Engineer. |
| Agriculturist. | Trader. |
| Gardener. | |

Incidence of Tuberculosis in Mysore According to Religion & Caste.



Every form of tuberculosis—not merely tuberculosis of the lungs but every form of surgical tuberculosis—has been met with in the various Hospitals and Dispensaries. The following is a list of the surgical forms of tuberculosis prevalent in the State:—

Varieties of Surgical Tuberculosis met with in the Mysore State.

Lupus of the Face.		Tuberculosis of the Tibia.
Tubercular Meningitis.		Do Femur.
Do Pleurisy.		Do Rib.
Do Peritonitis.		Do Sternum.
Do Laryngitis.		Do Vertebrae.
Tuberculosis of the Hip Joint.		Psoas Abscess; Cold Abscess back.
Do Knee-Joint.		Tuberculosis of the intestines.
Do Ankle-Joint.		Do Cæcum.
Do Elbow-Joint.		Do Rectum.
Do Great-Toe.		Tuberculosis of the Glands Neck.
Tuberculosis of the Bones of the feet.		Do do Armpit.

(Only Tuberculosis of the genito-urinary system has not been reported).

During my tour, round the State, I have detected Pulmonary Tuberculosis wherever I went. House-to-house inspection invariably leads to detection of one or more cases of Pulmonary Tuberculosis in any place. My conviction is that the medical men, who send the "Nil" reports, had failed to detect the cases in their vicinity. Some reporters have stated that they had come across Pulmonary Tuberculosis in stations in which they were formerly working, though the present incumbents have sent in "Nil" reports. Thus, with the help of the impressions of the Medical Officers, one is able to check the reports of other officers, who have missed the diagnosis. I have already explained that the diagnosis has been missed by a good many men and why the diagnosis is missed.

I have received detailed information about only 923 cases of Tuberculosis. I am perfectly convinced from what I saw during my tour that the number of cases must be far under the mark. Even in England, where the Anti-Tuberculosis measures are well organised, some of the Tuberculosis officers are of opinion that in every house, where a case of advanced Pulmonary Tuberculosis has been diagnosed, other cases of Tuberculosis are waiting to be recognised. Even assuming that no case has been admitted in the 54 dispensaries from which "Nil" reports were received, the 923 cases reported would roughly correspond to about 2,000 cases in the State. Very probably, even this would be far under the mark.

I will now summarise the inferences that could be drawn from a study of these 923 cases.

The total number of cases (including the cases reported without details) for the whole State including Kolar Gold Fields is 1,035; out of which, Mysore City contributes 9 per cent, Bangalore City 21·4 per cent and Kolar Gold Fields 10·8 per cent. These three Cities alone contribute 41·2 per cent of the cases admitted in the whole State.

Sixty-nine per cent of the tubercular cases admitted in the Hospitals were Hindus, twenty-three per cent were Mussalmans and about eight per cent were Christians. If we take into consideration all cases of Tuberculosis (Medical and Surgical), we find that the males are affected to a slightly greater extent than females. Amongst the Hindus, the proportion of males is slightly higher whilst amongst the Mussalmans and Christians, the proportion of females affected is slightly larger than the males. In the Kolar Gold Fields, the population is predominantly male and it is mainly composed of imported male coolies. Hence, the Kolar Gold Fields figures are left out of consideration, in the following tables, as the age and sex constitution of the population is different from that of the rest of the Mysore State.

Up to the age of twenty, more cases are admitted for Surgical Tuberculosis than for Pulmonary Tuberculosis. Between 20 and 35, there are more admissions for Pulmonary Tuberculosis.

Distribution of Tuberculosis among the various communities in 1926.

Community	Percentage of the admissions for tubercular disease.				
Hindus	...	...	...	...	69·1
Mussalmans	...	...	...	...	23·1
Christians	...	...	...	...	7·6

Distribution of Tuberculosis, both Pulmonary and Surgical, in Mysore according to Sex and Caste.

Caste and Sex	Percentage of the total admissions for tuberculosis	Caste and Sex	Percentage of the total admissions for Tuberculosis
Hindu Males	... 36'8	Christian Males	... 3'2
Hindu Females	... 32'2	Christian Females	... 4'4
Mussalman Males	... 10'7	Total Males	... 50'8
Mussalman Females	... 12'4	Total Females	... 49'2

Distribution of Pulmonary Tuberculosis according to Sex and Caste.

Caste and Sex	Percentage of the admissions for Pulmonary Tuberculosis	Caste and Sex	Percentage of the admissions for Pulmonary Tuberculosis
Hindu Males	... 34'3	Christian Males	... 5'6
Hindu Females	... 32'1	Christian Females	... 7'6
Mussalman Males	... 18'5	Total Males	... 50'0
Mussalman Females	... 21'5	Total Females	... 50'0

Distribution of Surgical Tuberculosis according to Sex and Caste.

Caste and Sex	Percentage of the admissions for Surgical Tuberculosis	Caste and Sex	Percentage of the admissions for Surgical Tuberculosis
Hindu Males	... 40'2	Christian Males	... 2'3
Hindu Females	... 32'4	Christian Females	... 4'1
Mussalman Males	... 9'5	Total Males	... 52'0
Mussalman Females	... 11'3	Total Females	... 48'0

Distribution of Tuberculosis (both Pulmonary and Surgical) in Bangalore City according to Sex and Caste.

Sex and Caste	Percentage of the total admissions for Tuberculosis	Sex and Caste	Percentage of the total admissions for Tuberculosis
Pulmonary Tuberculosis	... 51'3	Hindu Females	... 31'0
Other Tuberculosis	... 48'6	Mussalman Males	... 9'0
Total Males	... 50'0	Mussalman Females	... 5'4
Total Females	... 50'0	Christian Males	... 7'6
Hindu Males	... 33'3	Christian Females	... 13'5

BANGALORE CITY.

Distribution of Pulmonary Tuberculosis in Bangalore City according to Sex and Caste.

Sex and Caste	Percentage of the admissions for Pulmonary Tuberculosis	Sex and Caste	Percentage of the admissions for Pulmonary Tuberculosis
Total Males	... 49'1	Mussalman Males	... 7'8
Total Females	... 50'8	Mussalman Females	... 6'1
Hindu Males	... 30'7	Christian Males	... 10'5
Hindu Females	... 28'0	Christian Females	... 16'6

Distribution of Surgical Tuberculosis in Bangalore City according to Sex and Caste.

Caste and Sex	Percentage of the admissions for Surgical Tuberculosis	Caste and Sex	Percentage of the admissions for Surgical Tuberculosis
Total Males	... 50'9	Mussalman Males	... 10'1
Total Females	... 49'0	Mussalman Females	... 4'6
Hindu Males	... 36'1	Christian Males	... 4'6
Hindu Females	... 34'2	Christian Females	... 10'1

MYSORE CITY.

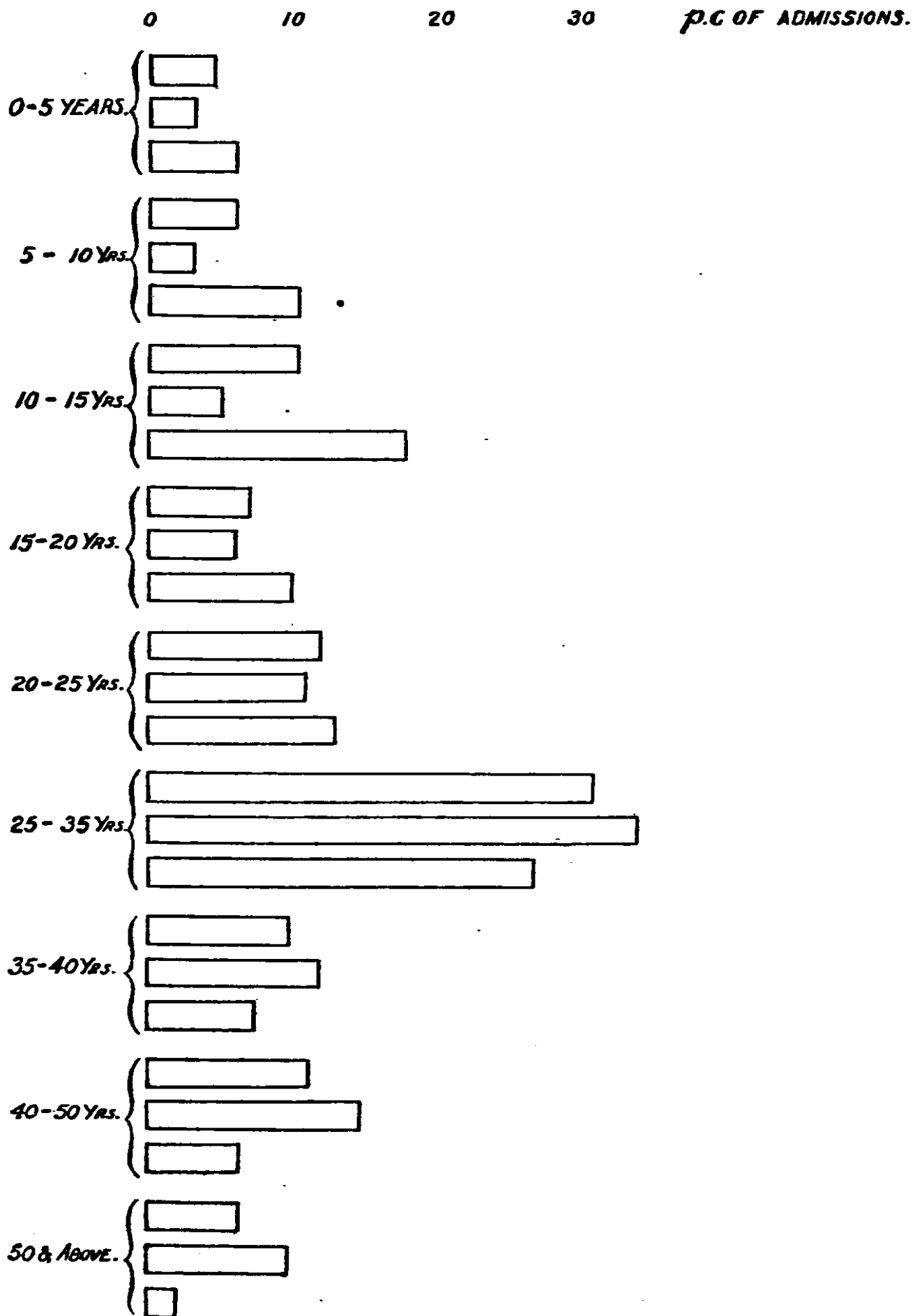
Distribution of Tuberculosis (both Pulmonary and Surgical) in Mysore City according to Sex and Caste.

Caste and Sex	Percentage of the total admissions for Tuberculosis	Caste and Sex	Percentage of the total admissions for Tuberculosis
Pulmonary Tuberculosis	... 47'8	Hindu Females	... 39'3
Surgical Tuberculosis	... 52'1	Mussalman Males	... 7'4
Total Males	... 49'5	Mussalman Females	... 13'8
Total Females	... 57'4	Christian Males	... 2'1
Hindu Males	... 32'9	Christian Females	... 4'2

INCIDENCE OF TUBERCULOSIS IN MYSORE.

According to age groups.

Expressed in percentage of total admissions.



= p.c OF TOTAL TUBERCULOSIS ADMISSIONS

= p.c OF ADMISSIONS FOR PULMONARY TUBERCULOSIS

= p.c OF DO DO NON-PULMONARY TUBERCULOSIS OR SURGICAL.

MYSORE CITY.

Distribution of Pulmonary Tuberculosis in Mysore City according to Sex and Caste.

Caste and Sex	Percentage of the admissions for Pulmonary Tuberculosis	Caste and Sex	Percentage of the admissions for Pulmonary Tuberculosis
Total Males ...	... 46.6	Mussalman Males ...	... 11.1
Total Females ...	... 53.3	Mussalman Females ...	... 8.8
Hindu Males ...	... 32.1	Christian Males ...	... 4.4
Hindu Females ...	... 44.4	Christian Females ...	... 0

Distribution of Surgical Tuberculosis in Mysore City according to Sex and Caste.

Caste and Sex	Percentage of the admissions for Surgical Tuberculosis	Caste and Sex	Percentage of the admissions for Surgical Tuberculosis
Total Males ...	... 38.7	Mussalman Males ...	... 4
Total Females ...	... 61.2	Mussalman Females ...	... 18.3
Hindu Males ...	... 34.6	Christian Males ...	... 0
Hindu Females ...	... 34.6	Christian Females ...	... 8.1

Distribution of Tuberculosis according to Age Groups in percentage of admissions in the Hospitals and Dispensaries.

Age	Tuberculosis of the Lung		Other Tubercular Diseases	Tuberculosis (both Pulmonary and other Tubercular)
	Percentage of admissions under each age group for Pulmonary Tuberculosis		Percentage of admissions under each age group for non-pulmonary or surgical tuberculosis	Percentage of admission under each age group for total tuberculosis
0 to 5 years ...	...	2.8	6.1	4.2
5 to 10 " ...	...	2.8	10.3	5.9
10 to 15 " ...	...	4.9	18.2	10.6
15 to 20 " ...	...	7	9.2	7.9
20 to 25 " ...	...	11.2	12.6	11.8
25 to 35 " ...	...	33.6	27.5	31.07
35 to 40 " ...	...	12.1	7.4	10.1
40 to 50 " ...	...	15	6.4	11.8
50 and above ...	...	10.2	1.8	6.6

N.B.—In column 1, the percentage is calculated on the number of admissions for Pulmonary Tuberculosis.

In column 2, the percentage is calculated on the number of admissions for non-pulmonary Tuberculosis.

And in column 3, the percentage is calculated on the number of admissions for both Pulmonary and non-pulmonary Tuberculosis.

Distribution of total Tuberculosis admissions during 1926 at various age periods according to Sex and Community.

Age	HINDUS			MUSSALMANS			CHRISTIANS			Grand Total
	Males	Females	Total	Males	Females	Total	Males	Females	Total	
0 to 5 years ...	2.1	1.3	3.5	0.33	0.43	0.76	...	...	...	4.26
5 to 10 " ...	2.4	1.9	4.3	0.76	0.54	1.3	...	0.33	0.33	5.93
10 to 15 " ...	4.0	3.5	7.5	1.3	0.98	2.3	0.22	0.54	0.76	11.06
15 to 20 " ...	1.8	3.5	5.3	0.43	1.0	1.5	...	1.00	1.00	7.80
20 to 25 " ...	4.2	4.3	8.6	0.65	1.7	2.4	0.22	0.54	0.76	11.76
25 to 30 " ...	...	...	...	...	...	...	...	...	...	...
30 to 35 " ...	9.8	10.1	20.0	3.2	4.9	8.2	1.30	1.50	2.80	31.00
35 to 40 " ...	3.6	3.3	7.2	1.5	1.2	2.7	0.43	...	0.43	10.33
40 to 50 " ...	5.6	2.5	8.2	1.4	0.87	2.3	0.43	0.43	0.86	11.86
50 and above ...	2.9	1.3	4.2	1.0	0.76	1.8	0.54	...	0.54	6.54
Total ...	36.8	32.0	68.8	10.8	12.5	23.4	3.15	4.34	7.48	100.54

The following diagram shows the distribution of the population between towns (including cities) and villages.

DIAGRAM SHOWING THE URBAN AND RURAL POPULATION IN EACH DISTRICT.

	5	6	15	20	25	30
BANGALORE DISTRICT AND CITY.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇◇◇◇◇◇◇	◇◇◇◇◇		
KOLAR DIST. AND KOLAR GOLD FIELDS.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇◇◇◇◇◇◇	◇		
TUMKUR DISTRICT.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇◇◇◇◇◇◇	◇		
MYSORE DISTRICT AND CITY.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇◇◇◇◇◇◇	◇◇◇◇◇◇◇	◇◇◇◇◇◇◇	◇◇◇◇◇
CHITALDRUG DISTRICT.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇◇			
HASSAN DISTRICT.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇◇			
KADUR DISTRICT.....	◆◆◆◆◆	◇◇				
SHIMOGA DISTRICT.....	◆◆◆◆◆	◇◇◇◇◇◇◇	◇			
CIVIL AND MILITARY STATION BANGALORE.....	◆◆◆					

EACH DIAMOND = 50,000 PERSONS URBAN POPULATION = ◆ RURAL POPULATION = ◇

The total number of diamonds represents the aggregate population of the district, while the black diamonds represent the urban population in it.

Though the death returns are unsatisfactory, still they can give some rough idea as to the havoc caused by Tuberculosis. The error in the case of the death returns for Tuberculosis is more likely to be in the way of omissions of tubercular cases than in the way of inclusion of other diseases under that heading. Most of the common people know fairly well the symptoms of consumption in the advanced stages, *viz.*, cough, fever and wasting of long duration, with or without Diarrhoea. The death returns are far under the actual figures.

The number of deaths from Tuberculosis reported in 1926 for the whole State was 709. (I received no information from about 91 places. Deaths have been reported from all Taluks and Districts. The largest number of deaths has been reported from the Cities of Bangalore, Mysore and Kolar Gold Fields, as might be seen from the accompanying table.)

Deaths from Tuberculosis in these three Cities alone amount to 80·8 per cent of the total deaths for the State.

The accompanying diagram copied from page 18 of the last Mysore Census Report gives the true explanation for this state of affairs. These three towns have a large urban population. If we exclude the Cities of Bangalore, Mysore and Kolar Gold Fields from the Districts of Bangalore, Mysore and Kolar, the percentages of mortality for Tuberculosis in these districts are not inordinately higher than the rates in the other Districts.

The mortality from Tuberculosis for the various districts in the State is given in the accompanying table:—

Mortality from Tuberculosis in the Mysore State during 1926.

				Percentage calculated on total deaths from Tuberculosis reported
Bangalore District including Bangalore City	...	...	...	43·8
Kolar District and Kolar Gold Fields	...	...	...	17·9
Tumkur District	...	...	...	2·6
Mysore District including Mysore City	...	...	...	25·1
Chitaldrug District	...	...	...	5·6
Hassan District	...	...	...	2·8
Kadur District	...	...	...	0·8
Shimoga District	...	...	...	1·0

Mortality from Tuberculosis in the Mysore State during 1926.

				Percentage calculated on total deaths from Tuberculosis reported
Bangalore District including Bangalore City	...	...	...	43·8
Bangalore City	...	...	...	40·0
Mysore District including Mysore City	...	...	...	25·1
Mysore City	...	...	...	20·8
Kolar District including Kolar Gold Fields	...	...	...	17·9
Kolar Gold Fields	...	...	...	10·0
Kolar District	...	...	...	8·0
Chitaldrug District	...	...	...	5·6
Mysore District excluding Mysore City	...	...	...	4·5
Bangalore District excluding Bangalore City	...	...	...	3·9
Hassan District	...	...	...	2·8
Tumkur District	...	...	...	2·6
Shimoga District	...	...	...	1·0
Kadur District	...	...	...	0·8

Density of Population.

			Houses per Sq. mile.	Persons per Sq. mile.
Mysore City	...	...	1,813	9,065
Bangalore City	...	...	2,463	12,315
Kolar Gold Fields	...	...	686	2,744
For the rest of the State	...	...	below 50	below 250

According to density of population, we might arrange the various localities in the following order :—

				Houses per Sq. mile.	Persons per Sq. mile.
Bangalore City	...	...	...	2,463	12,315
Mysore City	...	...	...	1,813	9,065
Kolar Gold Fields	...	...	...	686	2,744
Mysore District	...	...	...	50	250
Bangalore District	...	...	...		
Hassan District	...	...	...	44	220
Kolar District	...	...	...		
Tumkur District	...	...	...	38	190
Chitaldrug District	...	...	...	28	140
Shimoga District	...	...	...	24	120
Kadur District	...	...	...	20	100

In the accompanying tables, the mortality from Tuberculosis is expressed as percentage of the total mortality from all causes in the Cities of Bangalore, Mysore and Kolar.

In Bangalore City, Aralepet Division III is the worst place affected. Then follows Aralepet Division II or Balepet, Ganigarpet, Chamarajpet, Mavalli, and Malleswaram. Basavangudi seems to be the best of the Divisions.

In Mysore City, Erangere seems to be the worst locality. Old Agraharam comes next and then follow Weavers' Lines and Nazarbad Divisions.

BANGALORE CITY.

Year	DEATHS FROM TUBERCULOSIS			Total deaths	Percentage	Year	DEATHS FROM TUBERCULOSIS			Total deaths	Percentage	Remarks
	Men	Women	Total				Men	Women	Total			
1913 ...	...	...	144	2,733	5'26	1920 ...	103	170	273	3,875	7'04	
1914 ...	...	...	189	3,356	5'63	1921 ...	121	145	266	3,660	7'2	
1915 ...	...	...	192	2,865	6'7	1922 ...	163	140	303	3,806	7'9	
1916 ...	...	...	208	3,421	5'9	1923 ...	118	201	319	3,422	9'3	1 in 11
1917 ...	143	153	296	3,473	8'5	1924 ...	161	222	383	3,977	9'6	1 in 11
1918 ...	123	155	278	5,977	4'6	1925 ...	174	217	391	3,729	10'4	1 in 10
1919 ...	144	147	291	3,367	8'6	1926 ...	153	174	327	3,206	10'1	1 in 10

MYSORE CITY.

Year	DEATHS FROM TUBERCULOSIS			Total deaths	Percentage	Year	DEATHS FROM TUBERCULOSIS			Total deaths	Percentage	Remarks
	Men	Women	Total				Men	Women	Total			
1913 ...	...	...	183	2,020	9	1920 ...	45	110	155	2,219	6'9	
1914 ...	...	...	193	2,599	7'42	1921 ...	41	114	155	2,870	5'4	
1915 ...	...	...	151	1,897	7'9	1922 ...	47	109	156	1,796	8'6	
1916 ...	...	...	138	2,042	6'75	1923 ...	42	122	164	2,283	7'1	
1917 ...	53	148	201	2,828	7'1	1924 ...	54	138	192	2,438	7'8	1 in 13
1918 ...	38	130	168	3,835	4'3	1925 ...	53	153	206	1,866	11'3	1 in 9
1919 ...	47	131	178	2,302	7'7	1926 ...	58	155	213	2,075	10'2	1 in 10

KOLAR GOLD FIELDS.

Year	DEATHS FROM TUBERCULOSIS			Total deaths	Percentage	Year	DEATHS FROM TUBERCULOSIS			Total deaths	Percentage	Remarks
	Men	Women	Total				Men	Women	Total			
1914 ...	...	...	124	2,741	4.5	1921 ...	39	22	61	2,239	2.7	
1915 ...	...	...	119	2,271	5.2	1922 ...	58	32	90	2,319	3.8	
1916 ...	...	...	78	2,940	2.6	1923 ...	60	37	97	2,024	4.7	
1917 ...	63	47	110	2,395	4.5	1924 ...	62	38	100	2,469	4	1 in 25
1918 ...	34	20	54	5,221	1.03	1925 ...	48	25	73	2,230	3.2	1 in 33
1919 ...	27	26	53	3,251	1.6	1926 ...	50	20	70	2,296	3.04	1 in 33
1920 ...	39	26	65	2,362	2.7							

BANGALORE CITY.

Death Returns arranged according to the severity of infection.

Division.
 Aralepet III. Most infected.
 Aralepet II or Balepet.
 Ganigarpet.
 Chamaraipet.

Division.
 Mavalli.
 Malleswaram.
 Basavanagudi. Least infected.

MYSORE CITY.

Eranagere. Most infected.
 Old Agrahar.

Weavers' Lines. } Least infected.
 Nazarbad. }

Though it was pointed out in the previous pages that Tuberculosis was equally prevalent amongst men and women (slightly in excess amongst the men on the whole), death claims far more victims amongst the women than amongst men. For every one death amongst the tuberculous males, we have three deaths amongst the tuberculous females, if we take the mortality in 1926 for all the age groups, into consideration.

During the age period 10-15 the female deaths were 3 times the male deaths.

During the age period 15-20 and } the female deaths were 9 times the male deaths.
 During the age period 20-25 }

During the age period 25-35 the female deaths were 4 times the male deaths.

During the same age periods, the general mortality for all diseases amongst females in 1926 was not so high as the mortality for Tuberculosis.

During the age period 10-15 the general mortality amongst females was less than the mortality amongst males.

During the age period 15-20 the general mortality amongst females was 1.2 multiplied by the male deaths.

During the age period 20-30 the general mortality amongst females was 1.3 multiplied by the male deaths.

What is the cause of this extraordinarily high mortality amongst the Tuberculous females between the ages of 15 and 35?

Mortality from Tuberculosis during 1926 at the various age groups, according to Sex, in percentage of total deaths from Tuberculosis.

Age	Males	Females	Total	Age	Males	Females	Total
0 to 5 years ...	0.62	0.31	.93	25 to 30 years ...	6.5	24.3	30.8
5 to 10 " ...	0.78	0.78	1.56	30 to 35 " ...			
10 to 15 " ...	1.4	4.2	5.6	35 to 40 " ...	2.8	5.4	8.2
15 to 20 " ...	1.24	11.2	12.44	40 to 50 " ...	5	8.4	13.4
20 to 25 " ...	1.7	15.4	17.1	50 and above ...	4.2	5.3	9.5

Mortality from Tuberculosis during 1926 at the various age periods according to Community in percentage of the total deaths from Tuberculosis.

AGE	HINDUS			MUSSALMANS			CHRISTIANS			Total for each age group
	Males	Females	Total	Males	Females	Total	Males	Females	Total	
0 to 5 years	0'46	0'31	0'77	0'15	...	0'15	...	...	...	0'92
5 to 10 "	0'78	0'78	1'56	...	...	...	...	...	...	1'56
10 to 15 "	1'24	2'80	4'04	0'15	1'2	1'35	...	0'15	0'15	5'54
15 to 20 "	0'62	7'60	8'22	0'62	3'4	4'0	...	0'15	0'15	12'35
20 to 25 "	1'4	11'8	13'2	0'31	3'2	3'51	...	0'31	0'31	17'02
25 to 30 "	5'1	18'4	23'5	0'93	5'4	6'33	0'46	0'46	0'92	30'75
30 to 35 "	2'5	3'7	6'2	0'31	1'4	1'71	...	0'31	0'31	8'20
35 to 40 "	3'9	6'5	10'40	0'93	1'5	2'43	0'15	0'31	0'46	13'29
40 to 50 "	3'1	3'9	7'0	1'00	1'2	2'3	...	0'15	0'15	9'45
50 and above	...	...	...	...	...	...	...	...	...	...
Total	19'10	55'79	74'89	4'40	17'30	21'70 or 21'78	0'61	1'84	2'45	99'08

A study of the Birth Reports available to me throws some light in this important point during the year 1926. There were 1,432 confinements amongst *primiparous* women, i.e., women who were confined for the first time.

A study of the ages of the women who were confined for the first time during the year 1926 brings out many interesting facts.

The earliest age at which a Mysore woman or rather a Mysore girl gives birth to her first child is:—

The 14th year in the case of Hindus. (13th year in 2 cases (or 2 per cent) in the case of non-Brahmin Hindus.)

The 14th year in the case of Mussalmans.

The 14th do Adikarnatakas.

The 14th do Brahmins.

The 15th do Christians.

The 15th do Devangas.

The 15th do Jains.

The 15th (excepting 1 case in 13th) Vokkaligas.

The 15th year in the case of Lingayets.

The most common age for first confinements is:—

16th year (24 per cent) in the case of Brahmins.

18th year (28 per cent) do Hindus.

18th year (36 per cent) do Mussalmans.

18th and 20th years (60 per cent) in the case of Christians.

18th year (27 per cent) in the case of Lingayets.

18th year (23 per cent) do Vokkaligas.

18th year (25 per cent) do Adikarnatakas.

18th year (37 per cent) do Devangas.

The latest age for the first confinement was:—

40th year in the case of Hindus.

35th year do Mussalmans.

23rd do Christians.

35th do Brahmins.

24th do Lingayets.

32nd do Vokkaligas.

28th do Adikarnatakas.

19th do Devangas.

The ages at which the first confinements were most frequent for the various communities are given below in the order of predominance:—

Mussalmans ... 18th (most frequently)

16th

17th and

20th.

Christians ... 20th and 18th (most frequently)

16th and 22nd.

IN THE DIFFERENT,

IMUNITY.

AGE
GROUP

110

120

130

140

150

0-5 YRS {
H
M
C

5-10 {
H
M
C

10-15 {
H
M
C

15-20 {
H
M
C

20-25 {
H
M
C

25-35 {
H
M
C

35-40 {
H
M
C

40-50 {
H
M
C

50 & UP {
H
M
C

Hindus	...	... 18th (most frequently) 16th 20th and 17th.
Brahmins	...	... 16th (most frequently) 18th and 17th 15th 14th, 19th and 20th.
Lingayets	...	... 16th and 18th (most frequently, 20th 17th and 15th.
Devangas	...	... 18th (most frequently) 16th and 17th.
Adikarnatakas	...	... 18th and 16th (most frequently) 19th and 20th.
Vokkaligas	...	... 18th (most frequently) 20th 17th and 16th.

By the age of 20 years, the majority of the Mysore women of the different communities had been confined of their first babies.

,100 per cent of the Devangas
97 per cent of the Lingayets
94 per cent of the Mussulmans
91 per cent of the Brahmins
90 per cent of the Hindus
88 per cent of the Vokkaligas
84 per cent of the Christians
78 per cent of the Adikarnatakas

had been confined of their first borns by the 20th year.

About 90 per cent of the Mysore women (taking all castes together) are delivered of their first-born babies by the age of 20. We might presume that a fairly large proportion of women may be mothers of 2 or 3 children by the age of 25 years, as a normal woman would give birth to a child once in two or three years, and as 25 per cent of the women are confined of their first babies in the 18th year.

There is an old adage "A Tuberculous woman usually survives her first pregnancy, may or may not survive her 2nd pregnancy and never survives her 3rd pregnancy." I have verified this many a time in my own practice. Many of the Mysore women between 20 and 25 would be pregnant for the 2nd time or 3rd time and their vitality would have been considerably diminished by the early and repeated pregnancies and by the prolonged suckling of babies for inordinately long periods (a common occurrence in South India). Most of them are poor and their vitality is also lowered by repeated pregnancies and prolonged lactation. Such mothers break down in health and suffer from active clinical tuberculosis. On account of the careless habits of the mothers, their children would also be easily infected. Almost all the Medical Reports I have received emphasise the fact that tuberculous women die between the age of 20 and 40 years.

Every case of death from Tuberculosis would be equivalent to about 20 cases of Tuberculosis in our Indian Cities. (In countries with a highly organised Sanitary Service, the factor would be five.)

The deaths from Tuberculosis in the cities of Bangalore, Mysore and Kolar Gold Fields and Mysore State were 327, 213, 70 and 1,067 respectively, and so the probable number of cases would be at least:—

5 × 327 or 1,635 in Bangalore.	5 × 70 or 350 in Kolar Gold Fields.
5 × 213 or 1,065 in Mysore.	5 × 1,067 or 5,335 in Mysore State.

An average consumptive lives 6 to 18 months after being correctly diagnosed as such by the general practitioners. Each day he would throw out 7,280 billions of Tubercle Bacilli (the germs of consumption); and the bacilli may retain virulence for 40 days to 8 months in darkness, moisture and filth, after the phlegm has been spat out, in the ill-ventilated dark houses. A knowledge of these facts would enable us to understand why the disease has been spreading rapidly year after year.

Consumption is essentially a house disease. During the past 10 years, much evidence has accumulated all over the world to show that the death rate from all causes in one-roomed dwellings is much higher than in the two-roomed dwellings and that it is much higher in the two-roomed dwellings than in the three-roomed dwellings.

The house is the place where the tubercular subjects often become infected and the house is the place where the advanced consumptive disseminates the bacilli most, and infects everybody near and dear to him.

Housing affects the tuberculosis problem in three ways :—

- (1) The house itself may be infected, that is, the germs of the disease may be in the walls, the floors, or the furnishings.
- (2) The house may contain a careless consumptive who may directly infect the other members of the household.
- (3) The general sanitary condition of the house may be such as to lower the resistance of those who reside therein.

Dr. A. K. Chalmers of Glasgow gives the following table for that City.

No. of rooms.	Phthisis death rate per 1,000.	No. of rooms.	Phthisis death rate per 1,000.
1 ...	2.5	3 ...	1.2
2 ...	1.8	4 ...	0.7

The rate for the entire city was 1.8.

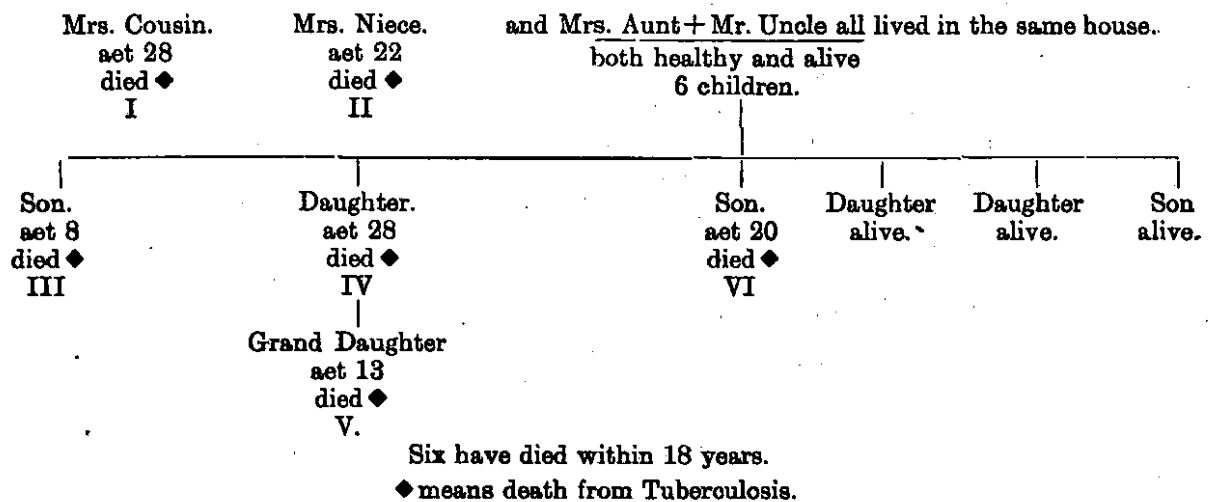
Though Tuberculosis, like all other communicable diseases, not infrequently affects the well-to-do under good housing conditions, it thrives best and is most prevalent among the urban poor, and therefore, under bad housing conditions.

So intimately has tuberculosis been associated with bad housing, that by many it is referred to as a "House Disease."

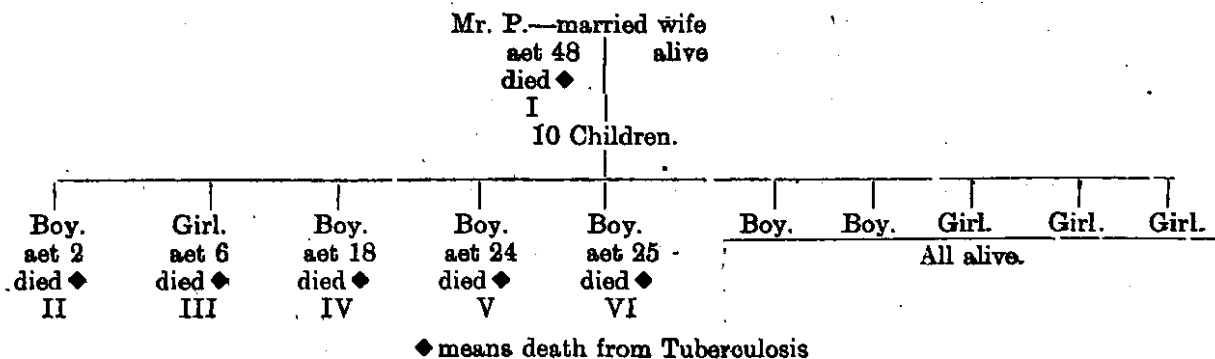
The four tables which follow serve to illustrate how the disease spreads from member to member in the same infected household. The families referred to in these tables lived in the old city portion of Bangalore.

TUBERCULOSIS—A HOUSE DISEASE.

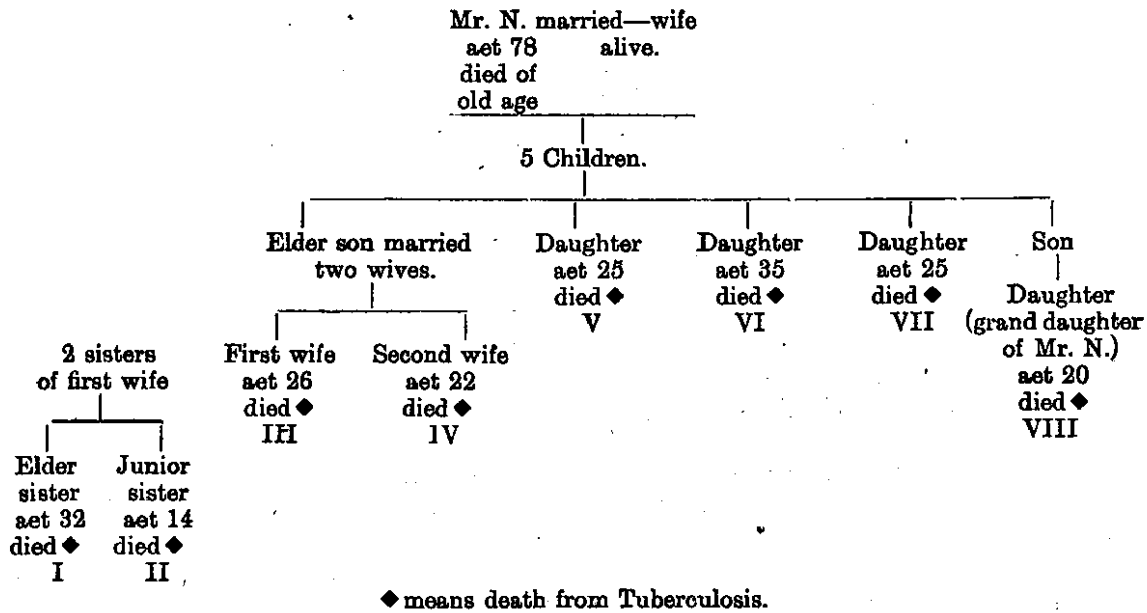
Deaths from Tuberculosis in Bangalore City—(S).



Deaths from Tuberculosis in Bangalore City—(P).



Deaths from Tuberculosis in Bangalore City—(N).



Poverty and ignorance are also determining factors. People live in poor houses because of the cheaper rent. When the income of the family is small, it becomes imperative in the cold weather that the windows and doors be closed and that the cracks of the windows be sealed up in order to give protection from cold.

The essential thing in the construction of houses is to secure for every room the greatest amount of direct outside light and air that can be secured. The only really satisfactory measure is to require every room to open either directly on the street, or on a large backyard, or courtyard.

How to get light into the dark rooms in existing dwellings, especially the older and ill-constructed ones, is a very perplexing problem. It is much more difficult of solution than the problem of furnishing sufficient light and ventilation in new buildings, because the old dwellings are already there. The only satisfactory way is to fix cheap "Pani" windows in the walls and recover the cost by many small instalments.

Every member of the society, *volens volens*, is infected with tubercle bacilli in early life. It is now admitted all over the world that Tuberculosis in childhood is universal. Tuberculosis hits the well-to-do as hard as the poor. Infection by the Tubercle bacillus being universal in childhood, we need not be afraid, in later adult life, of coming in contact with people who are suffering from active Pulmonary Tuberculosis.

Tuberculosis is essentially a childhood infection. By the age of 15, 50 per cent of the population are infected with Tuberculosis and by the age of 20, 96 per cent of the population according to the observations of Lawrason Brown in America.

Tuberculosis of the adult is the end of a song, the beginning of which for the unfortunate patient was sung in the cradle. Creeping on the floor dirtied with sputum, dried and un-dried, (spat by careless relations or brought into the house on the feet and shoes by servants and relations returning home from the streets), dirtying their fists, feet and toys and constantly shoving such dirty fists, feet, toys, etc., into their mouth, the children would be constantly infecting themselves in the majority of households.

Fondled and kissed by careless consumptive mothers and relations whose hands and lips are probably smeared unconsciously with infectious sputum, fed by careless and ignorant consumptive relations, constantly inhaling the germ-laden dust raised from the floor by dry sweeping, the children in infected houses are bound to be constantly infected.

Infection through the milk of infected cows is a recognised mode of infection in Europe and America. But, in this country, it can be ignored as (1) Tuberculosis in cattle is rare and (2) as the milk is invariably boiled before use. Infection through infected cowdung has been reported by some observers in America. This subject has not yet been studied in this country. Young infants when infected almost always succumb to the disease.

But during later childhood, the vitality is great and the children resist the inroads of the disease fairly well and acquire a fair amount of immunity lasting at least till the age of puberty.

As the disease is largely prevalent in Bangalore and Mysore and as the patients are ignorant of the methods of prevention, a large number of children are bound to be infected in infancy and childhood. To add to their troubles, the children are compulsorily being sent to schools where ventilation and lighting are very unsatisfactory.

In this connection, it is interesting to note that Dr. Nanjappa during the medical inspection of schools in the City of Bangalore during 1926 was able to detect Tuberculosis in over 1 per cent of the pupils. (If I were to examine the pupils specially with the object of detecting Tuberculosis, I should probably find a much higher percentage. In the Madras schools, Col. Donovan, during his hurried medical inspection, was able to detect 3 per cent infection.). When it is remembered that 13,705 boys and 4,175 girls (17,880 pupils on the whole) attend the schools in Bangalore City and 13,759 pupils (10,429 boys and 3,330 girls) attend the schools in Mysore City, the significance of Dr. Nanjappa's note would be understood. As the infection is a childhood infection, as the early indications are often found in the school-going age, and as preventive measures must date from the school-going period, I had the curiosity to visit some schools in Bangalore and Mysore. I must confess that I found the sanitary condition very unsatisfactory, especially in the schools in rented private buildings. I may state here that even the model schools I saw are constructed on a wrong type. I would not be surprised if signs of active Tuberculosis be detected in 20 to 30 per cent of these pupils in the course of another 10 years.

During adolescence and the succeeding decade, they would break down and suffer from consumption. In the case of girls, early marriage and early and frequent pregnancies will further increase the chances of breaking down. Most of the young infected married women unable to bear the strain of frequent pregnancies and prolonged lactation would collapse. The disease attacks the poor as well as the rich and kills off men and women in the best part of their lives between 20 and 40.

Is the disease curable? Can anything be done for the unfortunate consumptives?

Though 9 out of 10 people in civilized countries are infected with the tubercle bacilli, only 1 out of 7 dies of the disease. This shows that the disease is not very incurable. Many an individual lives and dies from some other cause without his knowing anything about the presence of tubercle germs in his body. Twelve to twenty-five per cent of the dead bodies of persons who die of some other disease in hospitals in India have revealed the existence of tubercular lesions, when examined post mortem. I mention this fact just to show that the disease is not very incurable. But the disease *can be cured only in the earlier stages*, before the lungs break down and the patient begins to spit. If the cases be diagnosed sufficiently early, the majority of the early cases can be "cured" by Sanatorium methods (practised at home or better in special institutions). But if the cases be diagnosed only in the later stages, as is done at present in this State, very little can be done for the patients.

As regards the treatment of Tuberculosis, the following Resolution passed at the 22nd Annual Meeting of the National Tuberculosis Association of the United States at the 1926 meeting held at Washington expresses the considered view of the Tuberculosis experts of the world:—

"Resolved that this Conference is in agreement concerning the following points in relation to Tuberculosis:—

- (1) There is no specific cure for tuberculosis (like antitoxin for diphtheria).
- (2) There is no specific preventive for tuberculosis (like vaccination for small-pox).
- (3) Among the important factors in the cure of active Tuberculosis are :
 - (a) Competent Medical supervision.
 - (b) Complete rest under favourable conditions.
 - (c) Carefully balanced and adequate nourishment suited to the individual.
 - (d) Abundance of open air and, if possible, of sunshine.
 - (e) Relief from other infections, or other physical or mental strains and handicaps.

- (4) Among the chief factors in the prevention of tuberculosis are: finding existing cases of Tuberculosis, and in each instance, bringing the patient under treatment suited to his condition; teaching him how to avoid the infection of others; examining contacts, and securing suitable treatment of actual or potential cases of Tuberculosis among them.
- (5) Another important factor is the searching out of those persons who, by reason of their physical condition, their occupation, or for other reasons, are likely to be especially susceptible to tuberculosis infection, such as seriously underweight children, undernourished adults who are recovering from other diseases or are subject to excessive fatigue, and persons who have a healed tuberculous infection, and securing for each of them such advice, treatment, assistance and relief as will minimize the likelihood of the development of tubercular disease on their part.
- (6) The general education of the people of every community as to the measures involved in the prevention of Tuberculosis and as to the curability of Tuberculosis in its earlier stages is of the utmost importance.
- (7) The hospitalization of advanced cases of Tuberculosis when home conditions are not readily subject to efficient management is an important means of care of the patient and of preventing the spread of infection.
- (8) The medical supervision and economic rehabilitation of patients discharged from Sanatoria demand particular attention.
- (9) Tuberculosis is often associated with under-nutrition and all steps leading to the discovery and proper treatment of under-nourishment among children and adults contribute to the prevention of Tuberculosis.
- (10) Medical students should receive adequate training in the diagnosis, treatment and prevention of Tuberculosis: there should be made available for all physicians in general practice an opportunity for intensive study and observation in the diagnosis of Tuberculosis; and there should also be made available in every community, as needed, the services of those already highly expert in the diagnosis and treatment of Tuberculosis.
- (11) While it is impossible to measure the exact effect of the various steps taken by communities for the prevention of tuberculosis, such as more intensive medical provision for diagnosis and care, public health nursing in the homes of the tuberculous, sanatoria and hospitals, public health education concerning tuberculosis, the supervision of the health of industrial workers, and similar steps, there is no reason to doubt that these measures have played an important part in bringing about the reduction in tuberculosis mortality, which has occurred practically everywhere.
- (12) There is every reason to believe that by a continuance and a further intensification of the measures for the prevention of tuberculosis as now understood, the present rate of decline of tuberculosis can be continued and increased.
- (13) We believe that the time has come to include in the tuberculosis programme the attack upon certain associated community health problems, such as child welfare and cardiac disease, provided that the programme for the application of existing knowledge in relation to the prevention of tuberculosis is well organised and fully maintained.
- (14) We believe that the deepening interest in the investigation of the causes, treatment and prevention of tuberculosis should be encouraged and developed."

I may say with Dr. Allen Kraus that "*Rest remains the sovereign remedy for tuberculosis. More direct and spectacular methods of treatment—inhalations, injections, drugs by mouth come and go: the years since 1900 have spawned hundreds of them. Few have survived the momentary sensation of their announcement: none has earned even a vogue: all this despite the fact that none has been employed unless rest were also a part of the treatment. Rest alone has returned thousands of consumptives to productive life. Of those who, while living an active life, relied on drugs or vapours or 'serums' or vaccines to fight their battle, few have made the journey back.*" We must bend our efforts to prevent infection before puberty and afterwards forestall unnecessary debilitating conditions.

No great movement of the present day in Europe and America has had a more far reaching effect upon the welfare and happiness of the human race than the organised fight against tuberculosis. Its influence has been seen in better houses

and hospital facilities for the poor, in shorter hours of labour and better working conditions for the labourer, in more intelligent expenditure of money, in nutrition and education. The money spent in the fight against tuberculosis should not be considered as expenditure incurred in stamping out only one of the many diseases prevalent in this State.

A well organized campaign against tuberculosis would result not merely in lowering the mortality from tuberculosis but also a host of other diseases. Tuberculosis is a disease of mal-nutrition using the word in the widest sense (food, water, air, rest are all included under the word). If the nutrition of the tissues be at par, the organism can resist the inroads of all disease-producing germs and tolerate their presence in the body.

An important part of the struggle consists in improving the general sanitation and increasing the vitality of the population so that the germs may not find a suitable soil in the bodies of the citizens.

We must beware of the danger we run by not providing for the treatment of the tuberculous patients. Like the poor, the consumptives are always with us. There is no good of shutting our eyes. We do not know when it will be our turn. Therefore, it is necessary that the Medical Officers of Health, the Tuberculosis Officer, the School Medical Officer, and the Officer in charge of Maternity and Child Welfare should all work together in looking after the interests of the citizens.

The preventive measures necessary to prevent the spread of this disease may be considered under three heads:—

- I. Those intended to prevent the infection of healthy persons.
- II. Those intended to prevent the conversion of early cases of closed tuberculosis into cases of open tuberculosis which are the real sources of danger to the community. Diagnosis in the early stages and treatment in Tuberculosis Dispensaries, Sanatoria and Solaria.
- III. Those intended to prevent the spread of infection from the open cases—
 - (a) Treatment of the advanced cases in Tuberculosis Hospitals in towns;
 - (b) Treatment of the surgical cases in Hospitals or Solaria.

Airlessness, sunlessness and foodlessness afford great advantage to the tubercle bacilli and enable them to implant themselves in the system. The prevention of infection in the case of healthy people is mainly a matter of general sanitation.

Measures that should be carried out by the Municipality are, opening out the congested areas, removal of end houses in blind alleys, demolition of old and narrow houses, widening of narrow dirty streets, efficient conservancy, building of model houses, provision of standard plans for houses of different sizes, provision of parks in crowded localities, insistence of a minimum breadth of houses (30-40 feet at least), the provision of open courtyards of minimum size inside the houses, the prohibition of promiscuous spitting in places of public resort, and above all stringent building regulations that will give sufficient power to the health authorities to prevent the erection of insanitary houses. Every room should have at least one window communicating directly with the outside air.

A very important prophylactic measure is the education of the public in matters pertaining to hygiene. This can be done:—

- (1) by giving instruction in hygiene to teachers during their period of training (of course the instruction must be given by medical men).
- (2) by teaching the elements of hygiene in all the schools (both elementary and secondary).
- (3) by the delivery of periodical lectures by the teachers or the Medical Officers in the neighbourhood on elementary hygiene and physiology, to the parents of the boys, in the school buildings, on some prominent holidays (like the Easter, Christmas, or Pongal Holidays).
- (4) by the delivery of lectures on sanitation in the vernaculars to the villagers by the Medical Officers and Taluk Sanitary Inspectors when on tour.
- (5) by the broadcast distribution of leaflets in the vernaculars on general sanitation and on the prevention of Consumption.
- (6) by the publication of the same in the vernacular journals of the state from time to time.

In schools, short lessons on general hygiene, on the danger of spitting on the floors and on the danger of licking the fingers, pencils, slates, stamps, etc., should be given. The danger of coughing without covering the mouth and the infectivity of the sputum should be clearly pointed out.

As infection with the tubercle bacilli or germs takes place in early childhood, one should be on the look out for the early stages of the disease in children. Hence the importance of the systematic medical inspection of schools and school premises. Even in cold climates, in Europe and America, open air schools are largely advocated nowadays. But we in India are building ill-ventilated and badly lighted schools. School buildings can be constructed much cheaper and simpler and better from a sanitary point of view than at present.

The school can be a great asset in the anti-tuberculosis campaign. The physical examination of the pupils coupled with information regarding the families and the investigations of the sanitary conditions of the homes of the children made by the school nurses would facilitate the discovery of centres of contagion. Such discoveries would be of great value both to the Medical Officer of health and the Tuberculosis Officer in prophylactic work. This procedure is of special value in this country where notification of tuberculosis is not obligatory.

The early diagnosis and treatment of the tuberculous sick is necessary not only in their interest but also in the interests of the general public. It is necessary to prevent cases of closed early tuberculosis becoming cases of open tuberculosis. The consumptives will not infect others in the earlier stages of the disease. And they can be cured only in the earlier stages of the disease.

The treatment of the cases diagnosed as early stages of consumption at the tuberculosis dispensary by the Tuberculosis Officer may be—

- (1) by open air treatment in a sanatorium, or
- (2) in the homes of the patients if there be sufficient facilities.

Very early cases can be treated at the tuberculosis dispensary. They can carry on treatment at home with the help of the Tuberculosis Officer.

By prompt treatment of the early cases of phthisis, the dissemination of the infection can be prevented to a large extent.

When the cases are diagnosed as advanced cases, it is desirable to remove them to a tuberculosis hospital or a *special sanatorium* for advanced cases, where the patients will have to stay for four months at least, unless they can be efficiently segregated and treated at home. A few months' stay in the sanatorium would be of great value to them in educating and teaching them correct sanitary habits. An individual who has lived in a sanatorium or a consumption hospital, for three or four months, can be depended upon to live in such a way as not to endanger his neighbours or his family.

Notification of all cases of open tuberculosis is highly necessary to enable the health authorities to take proper action. The notification will lead to the supervision of the surroundings, treatment of the infectious cases in the tuberculosis hospitals, and the search of incipient cases amongst the contacts. But, at present, in this country, I do not think compulsory notification advisable.

The tuberculosis hospital situated in the centre of the town will not be a source of danger to the neighbourhood as the disinfection of the sputa, etc., will be efficiently carried out inside the hospital. The tuberculosis hospital should work in conjunction with the tuberculosis dispensary. In this hospital the consumptives should be kept at rest and under treatment for some weeks. They can subsequently be sorted out into:—

- (1) those who after a brief stay and treatment can be turned over to the out-patient department for treatment or sent over to a sanatorium;
- (2) those who must be turned over to the sanatorium for advanced cases; the resting afebrile cases which are not advanced;
- (3) the incurable and hopeless cases which can be kept on till correct sanitary habits are learnt by the consumptives. They can subsequently be discharged or kept on if there be room. These cases should certainly have wards of their own, if they are kept on.

If the tuberculosis hospital be constructed in the heart of populous centres and not buried in the suburbs, it will attract many consumptives, as it will be easily accessible and as the invalids may be near their relations. When touring round the districts in this State, the patients who were examined by me and referred to the sanatorium at Mysore objected to leave their families and go far away. The proximity to their homes is a great inducement to the consumptive to enter the

hospital and it is very desirable that he should enter the hospital as early as possible.

A Tuberculosis Hospital in the centre of the town will also serve—

- (1) for the purpose of training tuberculosis nurses ;
- (2) for the purpose of investigation and discovery of better methods of treatment in the future.

The provision of a Pinjra Pole or Invalid Home for the hopeless incurable poor consumptives is a matter for private philanthropy.

The aims of the Tuberculosis Service are—

- (1) to cure the sick, and
- (2) to protect the healthy

by preventing the spread of the disease. (The school-going population has to be particularly looked after.)

Both measures are inter-dependent. If you cure the majority of the sick, the foci of infection would be diminished and there would be less chance of the spread of the disease. If you improve the general sanitation, the sick would also partake of the benefits and be in a better condition to resist the disease. They would also have better opportunities for the arrest of the disease.

The various measures necessary for combating tuberculosis in the State are :—

- (1) Improvement of the general sanitation of the Cities, especially Bangalore and Mysore Cities.
- (2) Systematic and thorough inspection of the schools and the pupils in the Cities of Bangalore and Mysore and construction of open air schools in future. In each of these Cities, Bangalore and Mysore, four part-time Medical Inspectors of Schools and four School Nurses are wanted to cope with the work at present, as there are about 120 schools in each City at present.
- (3) The provision of a tuberculosis dispensary, a tuberculosis hospital and a sanatorium for the Bangalore City alone. (One Tuberculosis Officer, a Graduate in Medicine, two Sub-Assistant Surgeons and two Nurses might be necessary for the tuberculosis dispensary, in addition to the usual clerical and menial staff. The hospital and sanatorium may start with 20 beds to 30 beds each and with the usually allotted Staff.)
- (4) The provision of a tuberculosis dispensary, a tuberculosis hospital and a sanatorium for the city of Mysore alone. (A tuberculosis hospital with 32 beds is wanted with the necessary equipment to supplement the existing sanatorium and dispensary both of which require to be reorganised and strengthened).
- (5) Arrangement for domiciliary visits—to be carried out by the staff attached to the tuberculosis dispensary.
- (6) A Sanatorium or rather a "Tuberculosis Settlement" for the whole State at Hassan.
- (7) The provision of a hill-station for the treatment of surgical tuberculosis in Jogimuradi or Devarayadurga or Nandi Hills.
- (8) Post-Graduate training for all the District Medical Officers and Assistant Surgeons and Sub-Assistant Surgeons in the early diagnosis and treatment of tuberculosis, as early as possible.
- (9) The formation of an Anti-tuberculosis League or Association for the Cities of Bangalore and Mysore separately for the purpose of propaganda work.
- (10) The provision of a tuberculosis officer for the City of Bangalore and another one for the City of Mysore. This Officer might be in charge of both the tuberculosis dispensary and the tuberculosis hospital, for the present.
- (11) The provision of a Director to look after the whole tuberculosis work in the State.

The tuberculosis dispensaries which are recommended for the cities of Bangalore and Mysore are intended for the purpose of early diagnosis in the early stages, for the sorting out of the cases, for the examination of the contacts in the houses of the tuberculous. The sanatoria are intended for the purpose of treating the very early cases so that the disease may be arrested and be prevented from advancing to the incurable open stage. The tuberculosis hospitals are intended for treating advanced cases of tuberculosis.

The functions of a Tuberculosis Dispensary are :—

- (1) to receive notifications.
- (2) to establish the diagnosis.
- (3) to decide as to the form of treatment necessary, i.e., Out-patient, residential, home, etc.
- (4) to visit and examine the contacts.
- (5) to be in touch with After-care Committee, Anti-tuberculosis League, School Medical Officers, Health Officers and General Practitioners.
- (6) to help the domiciliary treatment carried out by private practitioners, if requested by them.
- (7) to act as a bureau of information.

B. THE EXISTING FACILITIES FOR DIAGNOSIS AND TREATMENT.

Kolar Gold Fields.—Two hospitals are maintained here: one by the Mining Company and one by the Mysore Government.

Kolar Gold Fields has got a large floating population of labourers drawn from the neighbouring British Districts and their relations. The labourers often break down from hard work, etc., and suffer from tuberculosis.

Ten per cent of the Tuberculous cases admitted in the Hospitals and Dispensaries of Mysore are from Kolar.

As soon as the labourers break down in health and suffer from active tuberculosis, they are invalided by the medical officer of the Mines and I presume they lose their jobs. So having nothing further to do in the Mysore State, I presume they go back home to the British Districts to die.

Therefore, Kolar Gold Fields might be left out of consideration, in the present scheme.

Mysore City.—Mysore City is provided with—

- (1) a small Sanatorium with 30 beds;
- (2) a Tuberculosis Dispensary under a Sub-Assistant Surgeon for early diagnosis.
- (3) the wards of the Krishnarajendra Hospital are being used for the reception of tubercular cases, Medical and Surgical. The present Resident Medical Officer who had been in this hospital for a period of three years on a former occasion states that 25 per cent of the cases are tubercular. This hospital is being partly used as a tuberculosis hospital for the present for the reception of Surgical tuberculosis and fairly advanced to Pulmonary tuberculosis.

Bangalore City.—There is neither a Sanatorium nor a Tuberculosis Dispensary. The Victoria Hospital is being used at present for the treatment of Surgical Tuberculosis and fairly advanced Pulmonary Tuberculosis. Any time one might find about 10 or 12 cases of tuberculosis in the Wards.

The District Head-quarters.—These Hospitals at the District Head-quarters have a limited accommodation for in-patients (about 12 to 30 beds). The facilities at present for early diagnosis and treatment may be said to be 'Nil.'

The various Out-patient dispensaries.—These Dispensaries are all scattered throughout the State. Here again, there are no facilities at present for early diagnosis and proper treatment of the tubercular cases.

C. THE EXTENT TO WHICH THE EXISTING MEN AND INSTITUTIONS COULD BE UTILIZED IN TUBERCULOSIS WORK.

Kolar Gold Fields.—The existing general hospital is sufficient to give some temporary treatment to the tuberculous patients, who break down, from time to time.

Mysore City.—The City is badly affected by tuberculosis. During 1927, there were 190 deaths from tuberculosis and the average number of deaths during the last 10 years is 177 per annum. This corresponds to 5×177 or 885 cases of tuberculosis at the least (very probably to 3,540 cases in all stages including the very early stages).

The Sanatorium contains 30 beds. The accommodation is too small for the requirements. The accommodation will have to be increased to 100 beds in the near future. Even when enlarged, the Sanatorium can serve only the needs of Mysore City. It cannot suffice for the needs of the whole State as it is supposed to do. This Sanatorium must be reserved for the citizens of Mysore City. The Dental Surgeon and the Throat Surgeon of the Krishnarajendra Hospital might be asked to visit the Sanatorium once a week.

The Sanatorium is badly in need of a large single ward for 20 female patients with wide verandahs at the two sides and with nurses' rooms and bath rooms at the two ends. The present large ward used for both male and female patients might be used for the male patients alone. Better quarters for the Superintendent and the nurses are also necessary. It is inadvisable to further increase the number of small rooms for paying patients.

To break the force of the high monsoon winds, the Sanatorium should be protected by a belt of trees.

If a central administrative block with offices, laboratory, library, record-room, X-Ray-room, etc., on the ground floor and quarters for the Superintendent on the first floor be constructed to the windward side of the present large ward and the neighbouring large female ward to be constructed by the side of the former, the inconvenience of the monsoon winds might be mitigated. The belt of trees proposed and the administration block proposed would certainly break the force of the high monsoon winds. The present unsatisfactory Doctor's quarters and Offices might be utilized for Nurses' Quarters for extra nurses that may be required in the future when the Hospital is expanded; or for quarters for paying patients.

The whole ground must be laid out with level walks and walks of different gradients and supplied with small shelters and seats at every 100 or 200 yards and have the distances and gradients marked on sign boards.

The Sanatorium though situated in a picturesque site, suitable for Sanatorium purposes, is labouring under certain disadvantages. It is constructed in such a way that there is no economy in administration. It is also labouring under the disadvantage of being exposed to high monsoon winds. In England, Dr. Gordon who has been making observations on the relation between the rain-bearing winds and early tuberculosis in Derbyshire for a large number of years has come to the conclusion, as a result of extended study, "that there is a remarkable body of evidence showing that patients with early phthisis or consumption die more often and recover more rarely, when residing in exposure to strong rain-bearing winds than when residing in shelter from them and this is to a degree which cannot be considered negligible. Sanatoria should be located in shelter from the rain-bearing winds." The rain-bearing winds in Mysore are the monsoon winds and they are much stronger than the winds met with in England.

In the near future wet irrigation is likely to be extended towards the Sanatorium and the result would be increased dampness of the locality and increased prevalence of Malaria. The measures suggested above, *viz.*, a central high administrative block behind the large ward and the planting of a belt of trees would give the desired shelter from winds. Wet cultivation should be excluded for a radius of 5 miles. I may point out here that the plans for the new structures should be prepared under the guidance of Medical Experts.

The Tuberculosis Dispensary recently started is enough for the present. But the staff must be strengthened by the addition of an extra nurse preferably an Anglo-Indian and an Assistant Surgeon.

If the Krishnarajendra Hospital continues to admit the advanced consumptives and the Surgical Tuberculosis cases, no special accommodation in the way of a Tuberculosis Hospital is necessary for Mysore.

But, I think it desirable to exclude the tuberculosis cases from the Krishnarajendra Hospital, as it has been decided to remove the Medical College to Mysore and to utilize this hospital for clinical teaching. For teaching purposes, it is necessary to have ample and varied clinical material so that the students may come in contact with as many varieties of disease as possible in various stages. It would not do to fill up 25 per cent of the beds with tubercular cases. A separate Tuberculosis Hospital for Mysore is absolutely necessary. It may be situated near a congested area or preferably it may be constructed in a part of the Sanatorium compound. In the latter case, if it be constructed in 3 storeys, the ground floor might be utilized for the advanced consumptive patients, the first floor for male surgical patients, who might receive Sun-Treatment, and the second floor for female surgical patients who might receive Sun-Treatment.

I may point out that the surgical tuberculosis cases are nowadays treated in Europe in a Solarium (where they get graduated doses of sun-light and fresh air) and not on the operation table (where they used to be mutilated in olden days). I had been in search of a hill-station for Sun-Treatment or Heliotherapy for the Mysore cases. I examined Chamundi Hill as a possible site, but found that it is not possible to secure any large area sheltered from the monsoon winds. Below the slope on the entrance side to the temple is a small area belonging to private owners (Davane Dyava and Singa) which *might* serve for the purpose of putting up a small hospital of 20 beds for experimental purposes for the present. With the units proposed above, Mysore City (Mysore District would also share the benefit) would have a complete equipment.

Bangalore City.—Bangalore City is the worst affected spot in the whole State. The deaths from tuberculosis during 1926 were 325. As each death represents 5 to 20 cases of tuberculosis, the number of cases of tuberculosis in Bangalore City must be at least 5×325 or 1,625 (more probably 6,500 cases). Of all places in the State, this City is in urgent need of specific relief.

In the case of Bangalore City, there is no machinery that could be possibly utilised for tuberculosis work unless it be the rooms in the Out-Patient Department of the Victoria Hospital, which can be used for examining out-patients in the evenings. But, no staff is available for the work. A separate staff will have to be created.

In the case of Bangalore City, a Tuberculosis Dispensary with quarters for the Tuberculosis Officer will have to be constructed somewhere near the City Railway Station, so that it may serve all parts of the City and all extensions. As it is, Malleswaram is unprovided with Hospital accommodation of any kind.

The Tuberculosis Dispensary forms the most important unit in tuberculosis administration. It must be easily accessible to the whole City, and the nurses attached to the dispensary should be able to reach easily the utmost limits of the City from the centre.

As regards the admission of tubercular cases, the same considerations that make it desirable to remove the tubercular patients from the Krishnarajendra Hospital in Mysore hold good in the case of the Victoria Hospital also. The present Sowar Lines in the City, which is practically vacant, might easily be altered into a combined Tuberculosis Hospital and Tuberculosis Dispensary. It would be fairly central. It is not likely to cost as much as the construction of a new hospital and the machinery might be put into working order early.

Bangalore wants a Sanatorium for itself (the rest of the Bangalore District may also partake of the benefits).

There are two buildings in Nandi Hills which would suit the purpose very well, *viz.*, "Cubbon Bungalow" and "Glentilt." Very little alteration is required and it would cost very little. But the road to the top must be made negotiable for motor cars and buses. But if it be found impracticable to make an accessible roadway to the top, a site somewhere near Bangalore might be utilized for the construction of a suitable hospital. Details will be given later on, when a particular policy has been chalked out for action.

The District Head-quarters Hospitals.—The Hospital accommodation is small and the hospitals want all the available accommodation for treating the general disorders, especially cases of acute diseases like Typhoid, Pneumonia, Rheumatism, Malaria, etc.

There is no special provision for tubercular cases.

But, if two cheap shelters or huts be run up in the compound of the District Head-quarter Hospitals and if the District Officers be given a short course of training in Tuberculosis work for a few weeks, a fair amount of relief might be given. Cases which do not improve much might be sent over to a Central Sanatorium or Tuberculosis Settlement for the State.

The Out-Patient Dispensaries all over the State.—There are no facilities for early diagnosis and treatment. But, if all the Sub-Assistant Surgeons be given a short course of training, they would be enabled to diagnose the early cases and advise them to go to the District Head-quarters or to the Central Sanatorium. They might utilize two or three evenings for the purpose of detailed examination of suspicious cases. For the whole State, a Central Sanatorium or Tuberculosis Settlement is wanted as there is none, at present. It may be located at Hassan just outside the Municipal limits. A Central Sun-cure station or Hill Sanatorium may be located at Jogi Muradi near Chitaldrug or Devarayan Durga near Tumkur.

To sum up.—The medical men in the Districts can be utilized after a short course of training in tuberculosis work. But for the institutions suggested for Bangalore, the suggested Tuberculosis Hospital at Mysore, the Tuberculosis Settlement at Hassan and the Solarium at Jogi Muradi or Devarayan Durga, fresh staff would be required. Mysore City has two units to carry on part of the work. Bangalore City has no facilities of any kind, though it is in most urgent need of special facilities.

D. CLIMATIC CONDITIONS OF THE PLACES THAT MIGHT BE SELECTED
FOR LOCATING THE VARIOUS UNITS.

The Tuberculosis Dispensary and the Tuberculosis Hospitals should be in the centre of the towns in the areas to be served. But the Sanatoria (the so-called Tuberculosis Settlements do come under the head of Sanatoria) should be situated in cool, dry high lands outside the towns. The most desirable altitude is about 3,500 feet—4,000 feet above the sea level.

For the purpose of locating Sanatoria, I examined Bababudan Hills near Chickmagalur, Devarayan Durga near Tumkur, Chamundi Hills near Mysore, Jogi Muradi near Chitaldrug, Nandi Hill and Hassan. Of these, Bababudan is the most unsuitable on account of the heavy rain, high winds, difficulty of getting a fair amount of level ground sheltered from the monsoon winds and the long ascent.

Chamundi Hill.—Only very limited accommodation is available in the eastern side of the temple. The rainfall is under 40". The hill is easily accessible. The height is about 3,400 feet. This has been suggested in the report for a hill station for surgical tuberculosis. It is desirable to establish an experimental observatory here for a year before this can be utilized.

Nandi Hills.—Four thousand eight hundred and fifty-one feet in height, it would form a suitable site for a Sanatorium for Bangalore. It is cool, high and dry. It is found to be cool by the summer visitors. Here there is a record of rainfall, but not of the summer temperature. The rainfall is not heavy and the drainage is good. It has got the advantage of possessing two ready made buildings, which can be utilised at once, with very little alteration. But the road is not negotiable by Motor Cars and the conveyance of the sick to the top is very difficult. If a good road be constructed, this would be the most suitable spot for the Bangalore Sanatorium. Here again, an experimental observatory should be worked for one year.

Devarayan Durga.—It has got 3 terraces, the topmost being 3,940 feet above the sea level. This is practically inaccessible. The middle terrace which is lower contains only 2 bungalows and a small amount of level ground near it. This is also difficult of access at present, to patients. Though the road can be improved, there is not much accommodation. In the lower terrace is Village Nelapatnam. Close by is a very suitable spot protected by hills from both monsoons. The Deputy Commissioner of Tumkur and myself visited this spot, last November. We were both satisfied that it would be a very suitable site, as the place is situated in a hollow and sheltered to some extent from the monsoon winds. This terrace is accessible by Motors. It is about 9 or 10 miles from Tumkur. It would be desirable to keep an experimental observatory here also for one year to get accurate data about the meteorological conditions.

Jogi Muradi.—(Three thousand eight hundred and three feet above the sea level) near Chitaldrug is another suitable station. The hill is very easily accessible by a very good hill road. The place is very dry. The rainfall is low. On the top a large amount of suitable land is available.

There are many available spots on the gentle slopes at different heights. As it is in Chitaldrug District, I doubt whether the water-supply would be unfailing. I hear there is not likely to be much difficulty and that water can be had by sinking wells in the tank, a short distance below the summit. But the problem of water-supply must be investigated before finally fixing this spot. Here also it would be advisable to have an experimental observatory for a year. The Meteorological Reporter informs me that experimental observatories can be worked in Jogi Muradi, Nandi Hills, Devarayan Durga, and Chamundi Hills if the Government desires to do so.

Before finally making up our mind to fix one or more of those stations, I would suggest that arrangements should be made to record daily for a year, in these 4 stations, the temperature at 8 A.M., 12 noon and 2 P.M. in the shade, in addition to the usual dry and wet bulb observations, maximum and minimum temperature observations, rainfall and wind velocity. During the summer, the water-supply should also be investigated through the Engineering Department.

The tendency nowadays on the part of the Tuberculosis Expert is to pay more attention than in olden days to the after-care or arrested cases of Tuberculosis in what

are called the "The Tuberculosis Settlements." The best type of tuberculosis Settlement in England is one at Papworth near Cambridge, under the able management of the enthusiastic Dr. Varrier Jones.

The scheme for a Tuberculosis Settlement has been thus outlined by Dr. Varrier Jones, whom I had the pleasure to meet at Cambridge some years ago. Dr. Jones was kind enough to show me the whole machinery working. What we want for the whole State is one Tuberculosis Settlement at Hassan town just outside the Municipal limits.

In this State, which is largely agricultural, the scheme would be a great success, if the "Tuberculosis Settlement" be located at Hassan.

SCHEME FOR A TUBERCULOSIS SETTLEMENT.

The Settlement.

Sanatorium Department	... Diagnosis Ward. Clinical Ward. Operating theatre—Visiting Surgeon. Attention to teeth, nose, throat—Visiting Surgeon. X-Ray Installation. Clinical Laboratory. Sanatorium Block. Graduated Labour.
Hospital Department	... Hospital Block.
Industries Department	... Huts. Hostels. Cottages. Workshops— (a) Training. (b) Handicrafts. Outdoor Industries. Sale of Produce.

Fresh Staff required.

A complete scheme for dealing with the Tuberculosis problem in the State should include:—

- (1) Provision of a Tuberculosis Dispensary for Bangalore City.
- (2) Do Tuberculosis Hospital for Bangalore City.
- (3) Do Sanatorium for Bangalore City.
- (4) Do Systematic and thorough medical inspection of the schools in Bangalore City.
- (5) Do Tuberculosis Dispensary for Mysore City.
- (6) Do Tuberculosis Hospital for Mysore City.
- (7) Do Sanatorium for Mysore City.
- (8) Do Systematic and thorough medical inspection of the schools in Mysore City.
- (9) Do Tuberculosis Settlement for the whole State.
- (10) Do Sanatorium at Jogi Muradi for the whole State exclusive of Bangalore and Mysore Cities.
- (11) Do Post-Graduate Training in Tuberculosis work for the medical men in service.

As regards the men required to carry on the work, there are enough of men in Mysore for the work.

But I would suggest the desirability of importing from England a Tuberculosis Officer, one who has been doing work as Tuberculosis Officer or Deputy Tuberculosis Officer for years together, to direct the whole work and look after the Tuberculosis Settlement for the State. There is no use of sending a man for training for a few months or a year. None but an officer, who has been doing actual tuberculosis work both professional and administrative for many years in England would be suitable for the Director's work for at least 8 or 10 years. After the whole service has been well organised and put on a satisfactory basis, there would be no need for an outsider. I understand that one of the medical men has been sent to England for training in Tuberculosis and that he has shown an aptitude for surgical work. I would very strongly recommend that he should be asked to go over at once from England, where he seems to have finished his work, to *Leysin in Switzerland* and work in Professor Rollier's clinique, the best in the world for surgical tuberculosis work. He may work for one year under Professor Rollier.

As it may not be possible to take up all the units at once, the various units are arranged below in the order of urgency:—

- (1) A Tuberculosis Dispensary for Bangalore City.
- (2) Arrangements to have temporary observatories for one year at Nandi Hill, Chamundi Hill, Jogi Muradi and Devarayan Durga. It is advisable to take *automatic records* of the temperature to prevent fabrication.
- (3) Arrangements for systematic and thorough examination of the medical schools and pupils in the Cities of Bangalore and Mysore.
- (4) A Tuberculosis Hospital for Bangalore City.
- (5) Post-Graduate training in Tuberculosis for the medical men in the service.
- (6) Extension and Improvement of the Princess Krishnammanni Sanatorium, Mysore.
- (7) A Tuberculosis Hospital for Mysore City.
- (8) Construction of a motor road to the top of Nandi Hill.
- (9) Arrangements to start a Sanatorium with the necessary annexe for a Tuberculosis Settlement at Hassan.

Before concluding, I express my indebtedness for the kind help rendered to me during my investigations, and for many valuable suggestions, to the District Surgeons and other Medical Officers, the Deputy Commissioners, the Sanitary Commissioner, the Deputy Sanitary Commissioner, retired Sanitary Commissioners, the Health Officers, past and present, retired Provincial Officers, the General Secretary, the Superintendent, Government Press, and the various officers with whom I came in contact during my investigation.

EDWARD ELLIOTT ROAD,)
 MYLAPORE, MADRAS,)
 21st April 1928.

P. S. CHANDRASEKAR.