

CHAPTER XVI

MEDICAL AND PUBLIC HEALTH SERVICES

189. Survey of Public Health and Medical facilities in early times

For centuries the district was almost inaccessible mainly for two reasons. Firstly, the Ghats which separate it from the coastal plains were not easy to cross and secondly, the climate of the forest covered hilly tract lying to the west of Ghats was considered inhospitable to foreigners. From the early period of British occupation, official records are full of references to the unhealthiness of its climate. D. F. Carmichael has observed in the *Manual of the Vizagapatam District*, published in 1869, that "there is scarcely a man who visits these parts who does not return with an enlarged spleen or liver, more or less affection of the head, making business irksome, and with some constitutional breakdown". A newcomer to the district, even after a very short stay, was being suddenly attacked by malaria, a disease most dreaded. Even by 1940, after decades of fight against malaria and other diseases with very many public health activities, the district was still considered unhealthy. "Even at the present time", writes R. C. S. Bell, "the district cannot strictly be called healthy, for malaria is endemic almost everywhere and a special allowance is paid to officials serving there, who are not natives or domiciles of the district, to compensate them for the unhealthiness of the district. But malaria and its complications apart, the district is more salubrious than most parts of the Province."* Although the rule of granting special allowance still continues, most parts of the district, more specially its towns and headquarters Koraput, are no more dreaded, thanks to the sanitary and other hygienic measures. With a little precaution about food and drink a person may really enjoy a cool-summer at Koraput, on a 3,000-foot plateau.

Before the introduction of the Western system of medicine or allopathy, as it is popularly called, Ayurvedic system of medicine had for centuries existed in this country. Ayurveda received royal patronage from the court of Nandapur. It may also be presumed that the *Vaidyas* or *Kavirajas*, the followers of this system, practised mostly among the non-Adivasi residents of the Nandapur territory. *Vaidyas* in those days were very few, but nonetheless they had remarkable zeal for their system. The district has the unique distinction of having produced two

* R. C. S. Bell, *Orissa District Gazetteers*, Koraput

great scholars of *Ayurveda* whose works are said to be of considerable merit. These two men are Yogi Praharaj Mohapatra* and Maguni Das†.

It was by these able scholars and many others that the science of *Ayurveda* was cultivated in Koraput but the bulk of the population, belonging to the aboriginal tribes and residing in remote villages received but little benefit from them or from other *Vaidyas*. Unani had never been followed by anybody in this district and Homeopathy, which is a recent introduction, is at present confined to certain towns. The hillmen are generally muscular without any tendency to corpulence. Writing about cleanliness of the habitation of a hillman R. C. S. Bell states, "His womenfolk keep their houses and their surroundings spotlessly clean. Exhortation to cleanliness and advice upon sanitary matters are superfluous". But the observation is not true in case of all the hill tribes, many of whom are found unclean in body and habit.

Tribal people ordinarily ascribe diseases to evil influence of different deities or to witchcraft. To free themselves from diseases, they propitiate the deities and take the services of imposter-doctors (known among different tribes as *disari*, *bejjus*, *siras*, etc.) who pretend to counteract the effects of black art. Goddess Thakurani is worshipped to ward off epidemic like smallpox which visits in virulent form. A belief among certain hill tribes is that a sorcerer, possessing little finger of the right hand of a still-born child, can accomplish miracles, kill a healthy man or cure a sick man by his powers.

Faith in medicine among hillmen though feeble, many herbs possessing medicinal properties were known to them since time immemorial. Some of the commonest herbs in use are :

Name of the herbs	Scientific name	Disease in which used
(1)	(2)	(3)
1. Kochila ..	..	Kalazar
2. Chadhoi gudi ..	Hemidesmus	Black-water fever
3. Kochila seed ..	..	Malaria
4. Patalagaruda root	Rauwolfia serpentina	Snake bite

*Yogi Praharaj Mohapatra comes from an influential family of Brahmins, who were contemporary of Vikarm Deo I (1758—81) whose chief queen was his disciple. He was well versed in Sanskrit, medicine, music, art and astrology. So far two of his works on medicine *Vaidyalankara* and *Vaidya Hridayananda* and a work on Smriti called *Smriti Darpana* have been found. Of them *Vaidya Hridayananda* is published by the Oriental Manuscripts Library, Madras.

†Maguni Das, Ayurvedacharya, was born in Badakjmedi (Ganjam). He came and settled in Nandapur during the reign of Viravikrama Deo (1648—69) whose patronage he received. He is the author of a medical book *Ayurveda* which is written in the form of a dialogue between husband and wife wherein the husband explains the symptoms of diseases and their prescriptions for cure. This authoritative text is published by the Sanskrit Sahitya Parishad, Bombay.

(1)	(2)	(3)
5. Range Charo ..	Sesalania Pemicea	Poison eating inflammation, Eye and Ear Diseases, Dysentery, Erysepales, Gonorrhoea.
6. Bela ..	..	Dysentery
7. Bhuin nimba ..	Gentiana	Constipation

190. Vital Statistics, General standard of health as reflected by the statistics, Important causes of mortality

Vital statistics are available for years following the formation of Orissa Province (1936). Previously records of births and deaths were not maintained except by Union Boards of six towns, namely Jeypore, Koraput, Nowrangpur, Kotpad, Rayagada and Gunupur. The number of births registered and the birth-rate (number of births during the year per one thousand population) of the district yearwise are as stated below :

(i) Births and birth-rate

Year	Number of Births registered					Ratio of Births per 1,000 population		
	Total	Rural	Urban	Males	Females	Rural	Urban	Total
1	2	3	4	5	6	7	8	9
1936 ..	..	..	..	..	..	..	..	18.3
1947 ..	..	..	..	..	..	..	..	16.7
1954 ..	631	456	175	333	298	11.12	8.33	10.18
1955 ..	597	444	153	339	258	10.08	6.37	8.77
1956 ..	727	479	248	402	325	10.64	10.33	10.54
1957 ..	681	491	190	352	329	10.68	7.60	9.59
1958 ..	904	696	208	481	423	14.81	8.00	12.38
1959 ...	932	742	190	511	421	15.46	7.04	12.43
1960 ..	844	617	227	450	394	12.58	8.11	11.11
1961 ..	931	63	868	495	436	15.75	11.75	11.78
1962 ..	831	47	784	458	373	11.75	10.18	10.26

Due to non-introduction of Birth and Death Registration Act in the district and for want of any reliable agency for systematic collection of data on births and deaths much reliance cannot be placed upon the available figures. The village headmen and the Union Board staff are to report the data. That is why the number of births registered in the district is only a small fraction of the actual figures. Hence it is useless to compare the low birth-rate of this district, as shown from data available, with that of other districts. But the data available definitely points out that birth-rate in the villages is higher than birth-rate in urban areas.

Figures on death, collected through the same agency of village headmen and Union Board staff, have similar defect as they do not cover the entire district. Deaths registered are too few. The following table shows death registered and death-rate number of deaths per 1,000 population of the district :

(ii) Deaths and death-rate

Year	Number of deaths registered					Death-rate per 1,000 population		
	Total	Rural	Urban	Males	Females	Rural	Urban	Total
1	2	3	4	5	6	7	8	9
1936 ..	..	..	..	..	..	10.6	..	..
1947 ..	..	..	..	..	..	14.5	..	..
1954 ..	441	309	132	236	205	7.11	6.29	7.54
1955 ..	370	261	109	214	156	5.44	4.54	5.93
1956 ..	443	264	179	227	216	6.42	7.46	5.87
1957 ..	606	391	215	315	253	8.53	8.53	8.50
1958 ..	909	591	218	437	472	12.45	12.33	12.57
1959 ..	552	383	169	293	259	7.36	6.26	7.98
1960 ..	564	344	220	302	262	7.42	7.86	7.17
1961 ..	597	22	575	335	262	7.56	7.66	5.50
1962 ..	546	29	517	309	237	6.74	6.71	7.25

For the years covered by the foregoing tables number of infant deaths registered and infant mortality rates may be tabulated in the same manner. The infant mortality rates are expressed as the number of deaths among infants under one year of age per thousand live-births recorded during the period.

(iii) Infant mortality

Year	Number of infant deaths					Infant mortality rate per 1,000 population			
	Total	Rural	Urban	Males	Females	Total	Males	Females	
	1	2	3	4	5	6	7	8	9
1936	..	..	..	..	..	..	36.3	..	..
1947	..	..	..	..	..	..	127.60	..	..
1954	..	25	..	..	12	13	39.62	36.04	43.62
1955	..	17	7	10	9	8	28.47	26.55	31.01
1956	..	47	19	28	22	25	64.65	54.73	76.92
1957	..	52	34	18	31	21	76.36	88.73	63.83
1958	..	119	67	52	61	58	131.64	126.82	37.12
1959	..	64	38	26	43	21	68.67	82.19	49.88
1960	..	44	23	21	19	25	52.13	42.22	63.45
1961	..	55	2	53	28	27	59.08	56.57	61.93
1962	..	59	3	56	32	27	71.00	69.87	72.39

Infant mortality rate of the district is considerably lower than many other districts of Orissa ; but there is every possibility that the actual rate may be quite different from the rates shown above as most of the births and deaths including infant deaths go unnoticed. A special feature of the district is that infant mortality rate of males is generally lower than that of females, whereas the position is reverse in almost all other districts of Orissa.

Malaria, Gastro-intestinal diseases like diarrhoea, dysentery, etc., pneumonia, yaws and respiratory diseases are chief among the diseases causing death. Malaria takes the heaviest toll. The following table gives the death-rate of this district from different diseases for years noted against them. The figures are nearest to first decimal.

(iv) Death-rate per 1,000 population

Year	Death rate	Cholera	Small-pox	Fevers	Dysentery and Diarrhoea	Respiratory diseases	Injuries	Other causes
1	2	3	4	5	6	7	8	9
1936 ..	10.6	0.0	0.0	5.1	0.9	1.0	0.4	3.3
1947 ..	14.5	0.0	2.2	6.3	1.4	0.3	0.1	4.2
1949 ..	6.9	0.2	0.0	3.6	0.7	0.2	0.1	2.2
1950 ..	9.7	0.4	0.3	5.1	0.5	0.3	0.1	0.2
1951 ..	7.6	0.0	0.8	3.4	0.5	0.3	0.1	2.6
1952 ..	7.5	0.0	0.1	3.9	0.7	0.4	0.1	2.4
1953 ..	10.8	1.8	0.2	5.1	1.2	0.8	0.1	1.7
1954 ..	7.1	0.0	0.1	4.2	0.5	1.1	0.1	1.2
1955 ..	5.4	0.0	0.0	3.3	0.3	0.4	0.1	1.3
1956 ..	6.4	0.0	0.0	3.4	0.5	1.7	0.1	0.7
1957 ..	8.5	0.1	0.1	4.5	1.6	1.8	0.1	1.7
1958 ..	12.4	0.0	3.7	3.7	1.1	1.8	0.1	2.1
1959 ..	7.36	..	0.19	4.04	0.65	1.11	0.01	1.36
1960 ..	7.42	0.01	0.25	4.32	0.45	0.57	0.01	1.81
1961 ..	7.56	..	..	3.80	0.37	0.95	0.05	2.39,
1962 ..	6.74	..	..	3.43	0.74	0.49	0.19	1.89

191. Diseases common to the district**(i) Malaria**

The district is mostly feared for malaria and complications resulting from it. The disease is endemic everywhere throughout the district, but its occurrence is comparatively rare in Nowrangpur subdivision and the western fringe of Jeypore tahsil. Foreigners or immigrants are more subjected to this disease than the indigenous people, who gradually become immune to its attack and in adult life suffer very little from it. Black-water fever, a severe and dreadful fever, is rarely seen among the primitive settlers. Immigrants on the other hand are vulnerable to ordinary forms of malaria and its severe complications, black-water fever and cerebral malaria. With the use of very many modern discoveries of medical science and "possibly owing to the recognition of the part that indiscriminate or excessive use of quinine plays both in the causation and the aggravation of the disease, Black-water fever is now not as fatal as it used to be".

*R. C. S. Bell, *Orissa District Gazetteers*, Koraput, p. 90

The Bengal-Nagpur Railway Company, the Madras Government and the Orissa Government have taken various measures to reduce the risk of malarial infection in different parts of the district. Malaria was found to be the greatest hurdle in construction of the Raipur-Vizianagram Railway line which passes through the district and it took the Company decades to complete the task. An account of anti-malaria work in the district by the Railways may be found in the Appendix to this Chapter. Madras Government's prophylactic work was at the beginning centered at Koraput, the present headquarters and an account of it is given in Chapter XIX, Places of Interest. As a result of various anti-malarial measures undertaken first by the Madras Government and later by Orissa Government, Koraput, the present headquarters, is free of the disease as the mosquitoes, its carriers, have lost all the breeding-places in and around the town. At Jeypore too anti-malarial measures, similar to those of Koraput but on a smaller scale, were executed with favourable results. Since 1930, when a special Malaria Officer was appointed to carry anti-malarial measures at different places continuously, there has been gradual improvement of the health conditions of the district, particularly at Koraput and Jeypore. Recent anti-malarial measures are narrated separately in this Chapter.

(II) Yaws

A terrible disease, yaws or Framboesia, is prevalent amongst the more backward communities of this district. The Koyas of Malkangiri subdivision and the Khonds of Rayagada subdivision are the worst sufferers of this disease. The Savaras of Gunupur area who live beside the Khonds also catch the contagion. The Dombs and Sundhis, living in close proximity to these tribes, are also sometimes affected. The disease is seen among the Khonds of southern Ganjam and Koyas and Gonds of the eastern part of former Hyderabad State, but its occurrence excepting in some parts of Africa is not known elsewhere.

Yaws is known as "Koya Roguni" meaning Koya disease in Malkangiri subdivision, the land of the Koyas; but Khonds call it '*bata roga*' which may mean Gout (*bata*) disease (*roga*), for pain is felt in the joints in the first stage of the disease. Yaws bears a close outward resemblance to syphilis and is contagious through direct contact or through flies and clothes. We quote from R. C. Bell's Koraput District Gazetteer regarding the states of its development: "Yaws is a specific infectious granuloma caused by a spirochaete *Treponema pertinua*. It is not a congenital or venereal disease, though the course resembles syphilis. The primary lesion occurs extra-genitally and is not always demonstrable. The secondary stage consists of the development of papules which may coalesce into larger masses. Later the scales from the papules fall off and a yellowish fluid is exuded and forms a heaped-up yellow crust resembling syphilitic rupia. The tertiary stage

seen only in long standing cases, includes periostitis, inflammation of joints, caries of bones and ulcerations of the mouth and palate. Different forms of the disease occur, affecting the soles of the feet, causing ulceration in the palate, larynx or nose, causing nodular painful swelling on the nose, or forming tumours near the knees or elbows; these latter are painless. 'Yaws' is distinguished from syphilis for the facts that the primary lesion is never venereal, the central nervous system is never affected, the disease is not hereditary, and it fails to yield to Mercury treatment. It responds readily, however, to injection of arsenicals."

In the year 1937, 497 cases were treated in the district, whereas in 1956 the number was 3,188. There appears to be no sex or age restrictions; very young children often suffer from it. Rheumatism, osteitis, and ulcerations are believed to be its after-effects. A sufferer at first feels some amount of malaise, loss of vigour and weakness before the peculiar rash comes out.

The dispensaries at Motu and Balimela are specially meant for yaws treatment. The Medical Officers of those dispensaries tour the neighbouring villages, twenty days a month to treat patients at their doors. Facilities for yaws treatment are also provided in the hospitals and dispensaries of other places such as Rayagada, Nowrangpur, Kalyansingpur, Bissamcuttack, Gudari, Durgi, Gunupur, Mathili, Umarnkot, Malkangiri and Pottangi. As the number of yaws patients is steadily increasing additional allotments for purchase of special medicines is being provided. Besides, with the help of World Health Organisation, the Tribal & Rural Welfare Department has sanctioned for establishment of Anti-yaws Campaign consisting of two Medical Officers, specially trained in this regard, with sixteen Health Inspectors under them. Each Medical Officer is to be in charge of a team which is to move from village to village to treat yaws patients at their homes and to survey the prevalence of the disease. This campaign started by the beginning of 1956 is now at work in Pottangi tahsil and Rayagada subdivision. These teams, which provide much relief to yaws patients move to other yaws-affected areas of the district.

(iii) Venereal disease

Venereal diseases like, syphilis and gonorrhoea are also prevalent widely among most of the backward community. Attempts are being made to arrest this disease with Government grants every year for purchase of special medicines.

(iv) Leprosy

Leprosy appears to be comparatively rare in the district; but in Gunupur subdivision it is widely prevalent. Number of persons with this infection there, is above 2 per cent of the population. At Gunupur

there is a leprosy colony with ten beds. There are also 11 leprosy clinics within the area of Gudari, Gunupur, Nowrangpur and Borigumma police-stations. The District Leprosy and Epidemic Officer with the help of four Leprosy Assistants is in charge of the colony and clinics.

(v) **Other diseases**

Smallpox is a regular visitation. People very rarely take recourse to medicine when this epidemic starts, as they have a strong notion that goddess, Thakurani, alone can remove it. Due to enforcement of Epidemic Diseases Act making vaccination compulsory, the scheme is at work throughout the district. Cholera visits the district occasionally; but when it appears many fall a victim to it. In 1934 and 1953 this epidemic was severe. There were in 1953, 122 attacks and 68 deaths by its outbreak. The following table showing number of persons treated for important diseases during 1958—62 will give an idea about prevalence of diseases in the district :

Disease	1958	1959	1960	1961	1962
1. Malaria ..	34,004	24,399	31,292	27,779	30,963
2. Tuberculosis—					
(a) Lungs ..	192	84	153	424	333
(b) Other forms..	168	179	133	320	..
3. Scabies' ..	25,686	21,381	5,803	36,910	44,605
4. Yaws ..	2,974	1,762	2,851	2,548	990
5. Diarrhoea ..	9,608	11,251	24,798	15,603	17,897
6. Dysentery ..	8,428	9,596	17,360	8,142	14,432
7. Venereal disease	1,781	2,171	2,028	2,034	3,771
8. Leprosy ..	444	473	546	631	598
9. Influenza ..	1,916	3,420	4,922	6,529	9,087
10. Pneumonia ..	707	548	1,154	13,141	..
11. Labour ..	1,151	1,631	2,357	2,938	3,507
12. Cholera ..	13	1	6	..	1
13. Enteric fever ..	207	335	898	387	761
14. Smallpox ..	40	12	48	17	21

[70 B. of R.—48]

192. Public Hospitals and Dispensaries

The medical needs are met by 19 Hospitals, 28 Dispensaries and 17 Primary Health Centres maintained by the State Government. The Civil Surgeon, Koraput, is the Controlling Officer of all the medical institutions of the district. Each of these Allopathic institutions are under the charge of an Assistant Surgeon. Besides, there are 5 Ayurvedic Dispensaries in charge of Kavirajas and a Homeopathic Dispensary. A Mobile Health Unit is also functioning in the district. The technical staff of these institution in 1962 is as given below :

1. Doctors	..	31
2. Kavirajas	..	9
3. Nurses	..	11
4. Pharmacists	..	54
5. Midwives and Dais	..	89
6. Ward Attendants	..	104

A list of Public Hospitals, Dispensaries and Public Health Centres are given below :

Name of Institution	Year of establish- ment	Location
HOSPITALS		
1. District Headquarters Hospital..	1908	Koraput
2. Male Hospital ..	1887	Jeypore
3. Ghosa Hospital ..	1936	Jeypore
4. Subdivisional Hospital ..	1887	Rayagada
5. Bissamcuttack Hospital ..	1888	Bissamcuttack
6. Umarmkot Hospital ..	1921	Umarmkot
7. Gunupur Hospital ..	1869	Gunupur
8. Gudari Hospital ..	1922	Gudari
9. Subdivisional Hospital ..	1890	Nowrangpur

Name of Institution		Year of establish- ment	Location
10. Chandanpur Hospital	..	1961	Chandanpur
11. Dasmantapur Hospital	..	1961	Dasmantapur
12. Kashipur Hospital	..	..	Kashipur
13. Muniguda Hospital	..	1958	Muniguda
14. Puttasingi Hospital	..	1960	Puttasingi
15. Bandhugan Hospital	..	..	Bandhugan
16. Dorigan Hospital	..	..	Dorigan (Gudari)
17. Kumuti Hospital	..	..	Kumuti (Borigumma)
18. Kodinga Hospital	..	1958	Kodinga
19. Majhiguda Hospital	..	..	M a j h i g u d a (Kalyansinghpur).

PRIMARY HEALTH CENTRES

1. Boipariguda P. H. C.	..	1962	Boipariguda
2. Borigumma P. H. C.	..	1956	Borigumma
3. Chanduhandi P. H. C.	..	1958	Chanduhandi
4. Gudari P. H. C.	..	1957	Gudari
5. Hatborandi P. H. C.	..	1962	Hatborandi
6. Jagannathpur P. H. C.	..	1961	Jagannathpur
7. Katpad P. H. C.	..	1962	Kotpad
8. Kalyansinghpur P. H. C.	..	1960	Kalyansinghpur
9. Lakshmipur P. H. C.	..	1962	Lakshmipur
10. Lamptaput P. H. C.	..	1958	Lamptaput
11. Malkangiri P. H. C.	..	1956	Malkangiri
12. Narayanpatna P. H. C.	..	1956	Narayanpatna
13. Nandapur P.H.C.	..	1960	Nandapur

Name of Institution	Year of establishment	Location
14. Papadahandi P. H. C.	.. 1956	Papadahandi
15. Padmapur P. H. C.	.. 1961	Padmapur
16. Sanamorigan P. H. C.	.. 1961	Sanamorigan
17. Kashipur P. H. C.	.. 1956	Kashipur

DISPENSARIES

1. Ambadola Dispensary	.. 1927	Ambadola
2. Bhairabasingpur Dispensary	.. 1927	Bhairabasingpur
3. Borigumma Dispensary	.. 1926	Borigumma
4. Boipariguda Dispensary	.. 1936	Boipariguda
5. Dabugan Dispensary	.. 1927	Dabugan
6. Durgi Dispensary	.. ..	Durgi
7. Kalyansinghpur Dispensary	.. ..	Kalyansinghpur
8. Balimela Dispensary	.. ..	Balimela
9. Kotpad Dispensary	.. 1931	Kotpad
10. Lakshmipur Dispensary	.. 1927	Lakshmipur
11. Narayanpatna Dispensary	.. 1923	Narayanpatna
12. Nandapur Dispensary	.. 1923	Nandapur
13. Motu Dispensary	.. ..	Motu
14. Hohoro Dispensary	.. ..	Hohoro
15. Padmapur Dispensary	.. ..	Padmapur
16. Raighar Dispensary	.. ..	Raighar
17. Mathili Dispensary	.. 1923	Mathili
18. Pottangi Dispensary	.. 1916	Pottangi
19. Padwa Dispensary	.. 1904	Padwa
20. Malkangiri Dispensary	.. 1909	Malkangiri

AYURVEDIC DISPENSARIES

1. Podia Dispensary	.. ..	Podia
2. Kundra Dispensary	.. ..	Kundra
3. Jaltar Dispensary	.. ..	Jaltar
4. Papadahandi Dispensary	.. ..	Papadahandi
5. Tiruveli Dispensary	.. ..	Tiruveli
6. Dasmantapur Dispensary	.. ..	Dasmantapur
7. Kujendri Dispensary	.. ..	Kujendri

HOMEOPATHIC DISPENSARIES

1. Tentulikhunti Dispensary		Tentulikhunti
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Total number of indoor patients treated during the period from 1958 to 1962 in the hospitals are as given below :

Indoor patients	1958	1959	1960	1961	1962
Male ..	1,962	1,925	2,792	2,777	2,450
Female ..	1,484	1,361	1,619	1,536	1,481
Children ..	704	655	892	807	897
Total ..	4,152	3,941	5,303	5,120	4,828
Cured ..	3,532	3,212	4,502	4,190	3,905
Relieved ..	263	370	388	483	514
Discharged otherwise ..	242	219	265	306	258
Died ..	115	140	148	141	151

The Headquarters Hospital, Koraput, has facilities for treatment of Rabies. Recently Government has sanctioned facilities for anti-Rabic treatment in the Subdivisional Hospital at Nowrangpur.

The Ghosa Hospital at Jeypore, where only women are treated, was built in 1936 by the Late Maharaja of Jeypore in memory of his mother Srimati Sitapata Mahadevi and handed over to the Taluk Board for maintenance. Later the Government took over its management.

The hospitals at Koraput, Nowrangpur, Umarmkot and Rayagada have also maternity centres.

193. Private Hospitals and Dispensaries

Besides the public hospitals and dispensaries maintained by the State Government there are a number of other hospitals and dispensaries run by the Railways, Dandakaranya Development Authority, Industrial establishments, Missionaries and also under Machkund and Balimela Projects. Except the Mission Hospitals others are primarily meant for the benefit of the employees. There is a departmental hospital at Koraput maintained for the police staff of the district.

S. E. Railways have one dispensary at Rayagada with two qualified doctors. D. B. K. Railways run three dispensaries at Padwa, Koraput and Jeypore. Dandakaranya Development Authority maintains one dispensary at Koraput and four other mobile units at Jeypore, Umarmkot, Raighar and Malkangiri, all with qualified Medical Officers. Jeypore Sugar Factory and J. K. Paper Mills maintain dispensaries at Rayagada and Chandili respectively. E. L. C. Mission runs two hospitals at Nowrangpur and Bissamcuttack. The Mission Hospital at Nowrangpur has about 100 beds and that at Bissamcuttack 30 beds. The Machkund Hydro-electric Project have one hospital at Anakadelli and two dispensaries at Machkund and Jalaput. The Balimela Hydro-electric Project also has its own hospital with 8 beds.

The Railway Hospital at Rayagada is maintained by the South-Eastern Railways and is meant for Railways employees. The Police Hospital at Koraput having six beds is maintained by the Police Department and is meant for departmental employees.

(i) **Private Practitioners**

There are six private practitioners in the district, who are all stationed in urban areas. Of them some are specialists in tuberculosis.

194. Medical and Public Health Research Centres, and Institutions for disseminating knowledge on public health, e.g., birth control and nutrition

(i) **Training Centres**

One Dai training centre is attached to the Ghosa Hospital, Jeypore where eight candidates are being trained every year. A compounder training class is attached to the Headquarters Hospital, Koraput, where three candidates are trained every year.

(ii) **Indian Medical Association, Koraput Branch**

Koraput district branch of Indian Medical Association under the presidency of Civil Surgeon, Koraput, has been established in 1958. Both private practitioners and Government Surgeons are members of this Association. Its aim is to discuss clinical case records and medical problems for the improvement of medical science.

(iii) **Family Planning Centres**

There are in all seven Family Planning Centres (1962) in this district which propagate the value of birth control and distribute different appliances. Their activities are as given below :

Family Planning Centres	Persons contacted	Population covered by the centres
1. Ghosa Hospital, Jeypore ..	1,363	35,000
2. H. C. Hospital, Koraput ..	805	30,000
3. P. H. Centre, Borigumma ..	1,675	34,471
4. P. H. Centre, Narayanapatna ..	2,309	39,843
5. P. H. Centre, Kashipur ..	1,896	53,041
6. P. H. Centre, Malkangiri ..	1,243	25,109
7. P. H. Centre, Gudari ..	1,084	27,000

195. Sanitation

(i) The following are the problems faced by the Public Health Department :

HOUSING

The rural sanitation of the district is far from satisfactory. Adivasis mostly live in ill-ventilated and unhygienic *Katcha* huts. In their construction no attention is paid to light and ventilation. Even at noon

the rooms remain dark. As fire is lit inside, the atmosphere becomes polluted by the smoke. Cattle are also kept in the same house where they live. Their urine and dung are kept just in the backyard.

DRAINAGE

The drainage system in the rural areas is similarly unsatisfactory. The towns and some of the Grama Panchayats are able to maintain drainage system, but many other Grama Panchayats are unable to do so because of their low income. The lanes of most of the villages are congested, muddy and untidy.

LATRINE

The villagers have no proper idea about sewerage disposal. They are not in the habit of using latrines. Although the Community Development Department is providing Barpali type of latrines in villages in Block areas, they are yet to become popular. The villagers have the habit of using tank and river banks and also open places as latrines which leads to contamination of water sources and therefore water-borne diseases are common in the villages.

WATER

The main water sources in the villages are rivers and streams which are often contaminated. The Revenue Department has constructed wells in some of the villages. But villagers are not used to wells. They continue to depend on distant springs or streams.

FOOD

Adivasis eat mushrooms, roots, bamboo shoots and dried meat. They occasionally get poisoned.

LIGHTING

Except in the Urban areas and Gudari, Koraput and Kotpad there is no lighting arrangement in villages of the district.

(ii) Administrative set-up for the maintenance of Public Health and sanitation in Urban and Rural areas

The District Health Officer is in charge of the Public Health Organisation of this district. He controls and supervises the work of all the subordinate Public Health staff in the district. The following is the technical staff of the Department in this district :

1. District Health Officer	..	1
2. Assistant Health Officer	..	1
3. Health Officer (Jeypore Municipality)	..	1
4. District Leprosy and Epidemic Officer	..	1
5. Compounders	..	2
6. Health Inspectors	..	21
7. Vaccinators	..	33
8. Leprosy Assistants	..	4
9. Disinfectors	..	10
10. Anti-Malaria Mulias	..	15

The Health Officer, Jeypore Municipality, is directly responsible to the Chairman of the Municipality for all Public Health matters in that area. There are two Health Inspectors, two Vaccinators and three Disinfectors working under him.

The Notified Area Councils at Koraput and Nowrangpur are also provided with one Health Inspector, one Vaccinator and one Disinfecter each. The District was formerly divided into 9 Health Ranges with headquarters at Koraput, Pottangi, Bissamcuttack, Gunupur, Jeypore, Nowrangpur, Malkangiri, Rayagada and Umarkot. During the last few years six more Health Ranges were created at Narayanpatna, Kotpad, Balimela, Padwa, Dabugan and Papadahandi. Each of these fifteen Health Ranges is in charge of one Health Inspector, who is provided with one or more vaccinators according to the density of population and area of his range. Health Ranges are divided into one or more circles and a Vaccinator remains in charge of one circle.

The Public Health work of the Block area is in charge of the Block Medical Officer. One Health Inspector works under him being attached to Primary Health Centres.

The District Leprosy and Epidemic Officer supervises the work of four Leprosy Assistants who are in charge of Leprosy Colony at Gunupur and Leprosy Clinics at 11 places. The Assistants treat Leprosy patients and undertake preventive measures.

There was a Malaria control team at Rayagada which was controlling an area of 660 square miles with more than 800 villages and affording protection to a population of 1,20,000 approximately by one round of D. D. T. residual spray. The World Health Organisation which was organising the project since March, 1949 withdrew in April, 1951 handing over the entire responsibility of carrying on the 'project' to the Malariologist and leader of the parallel team, and work was managed exactly on the same lines.

196. Activities of Health and Sanitary Organisation

The main activities of Public Health Department are general sanitation, proper disposal of refuse and night soil, etc., by composting the trenching grounds, chlorination and disinfection of water sources and regular inspection of markets for adulterated food-stuffs. In addition to this the Department looks to control of epidemics like smallpox, cholera, yaws and control of Malaria.

(i) Anti-Malaria measures

Malaria accounts for the largest number of sufferers, and so anti-malaria measures are always being taken. Quinine and its substitute are freely distributed through the agency of the Public Health staff and

Village Level Workers of the Welfare Department and also through the staff of National Extension Blocks to prevent the disease. The National Malaria Control Unit does the work of spraying of D. D. T. in Rayagada subdivision and in some villages of Koraput subdivision. Control measures with gammaxine spray every three months and some other anti-malarial measures are also taken up in Koraput town by Public Health Department and as a result low incidence of Malaria is observed. Malaria control measures in Pottangi (restricted to oiling and maintenance of sub-soil drain) and Malkangiri are also being undertaken.

Consequent on the abolition of the World Health Organisation Scheme at Rayagada the anti-malaria work is being carried on with effect from 2nd August, 1953 under National Malaria Eradication Programme Scheme. The National Malaria Eradication Programme Unit working in the district consists of four sub-units. One such sub-unit has been located at Rayagada. Each sub-unit consists of one Senior Malaria Inspector, one Junior Malaria Inspector, six Superior Field Workers and twenty-nine Field Workers. Collection of data in different endemic and hyper-endemic areas in respect of entomology, spleen, parasites, morbidity and mortality rate, etc., in order to assess the result of the present anti-malaria work, is being carried out under the scheme. Treatment of Malaria patients by anti-malaria drugs, namely, Resochine tablets is being carried on.

(ii) Anti-Small pox measures

VACCINATION

After the enforcement of Epidemic Diseases Act, making vaccination compulsory throughout the district since June, 1957, the difficulty previously encountered by the Public Health staff in refusal of the people to take vaccination, has lessened to considerable extent. Besides the usual Vaccinators of the Public Health Department, who are in charge of one Circle each, some temporary Vaccinators are appointed under Mass Vaccination Scheme.

The following table gives primary and revaccination figures for the year noted against them :

Year	Primary Vaccination	Revaccination	Total
1	2	3	4
1936 ..	34,129	34,177	68,306
1947 ..	31,139	84,954	116,093
1949 ..	27,962	58,725	86,637

Year		Primary Vaccination	Revaccination	Total
1		2	3	4
1950	..	30,865	63,986	94,841
1951	..	27,617	106,836	134,453
1952	..	43,937	120,722	164,659
1953	..	53,274	84,424	137,698
1954	..	39,012	77,189	116,201
1955	..	47,025	88,722	129,747
1956	..	44,124	78,350	122,474
1957	..	54,701	91,541	146,242
1958	..	85,536	167,473	216,009

There are some difficulties which stand on the way of successful vaccination. They are —(a) it takes a longer time for the vaccination lymph to reach the district, (b) the Vaccinators fail to utilise the lymph within the time-limit because of the scattered population in remote villages, which are mostly inaccessible for want of communications, (c) dense forests infested with wild animals make it impossible on the part of the Vaccinators to move from village to village.

(iii) Anti-Tuberculosis Measures

B. C. G. VACCINATION

A Technical Team for Kalahandi and Koraput districts is working to fight against tuberculosis. The team functions with the aid of WHO and UNICEF. B. C. G. vaccination is being carried out by the team on a mass scale.

APPENDIX *

The following account of the anti-malarial work done by the Bengal-Nagpur Railway Company has been contributed by Mr. R. Senior White, F. R. S. E., Malariologist to that Railway. It throws an interesting light on the difficulties of malaria protection in the district :

"The Jeypore hill tracts have always been notorious for their malaria, and following on the discovery of the mosquito transmission of the disease by Sir Ronald Ross, some of the earliest investigations into malaria in India were conducted in the Koraput area in 1902 by Prof. J. W. W. Stephens and Colonel Sir Richard Christophers, I. M. S. Major E. L. Perry, I. M. S., spent sixteen months on malaria investigation in these hills in 1912-13, making Koraput his headquarters. But none of these investigators penetrated the Bissamkatak taluk in the north-east of the district, about which all that continued to be known was that the Vizagapatam District Gazetteer gave it the palm for being the most malarious area of the whole district. It was through this notorious, but scientifically unknown region that the Bengal-Nagpur Railway constructed their Raipur-Vizianagram line in 1925—31.

The route of the Raipur-Vizianagram Railway was originally surveyed by the now defunct East Coast Railway in 1883—86. Two years were spent on reconnaissance before a practical route across the Eastern Ghats was discovered, two years more in actual survey. The records of this party are lost, but it is known that they suffered very severely from malaria. In 1897, a further survey by the same railway, to change the alignment from that of metre to that of a broad gauge line, was undertaken. This party broke down from malaria 99 miles from Vizianagram, just south of the summit of the pass at Satikona, after traversing barely 40 miles of the hyper-endemic zone. In 1907 yet another party of Bengal-Nagpur Railway Engineers essayed a resurvey, but likewise broke down after achieving only two miles further than their predecessors of ten years before. Lastly, in 1923, the 24 miles across the summit of the range, from a point north of what is now Singhpur Road Station to the site of the present Muniguda Station, were again resurveyed. By this time the railway from Vizianagram to Parvatipur (48 miles) was open, and motor transport was to certain extent available. Only three months, January to March were spent in the field, and the Engineer-in-charge left rail-head with all his staff duplicated. On completion, only 25 per cent were effective.

When, therefore, actual construction was authorised, it was obvious to the Railway administration that malaria was going to be a most potent factor in the forthcoming operations, and, before any importation of labour was commenced, a whole-time Malariologist was added to the

*See page 375 *infra*

cadre of the medical department of the railway, and posted to the construction. The problem was an immense one. Of the 242* miles to be built from Raipur to Parvatipur, only the first thirty and the last four were found to be in non-malarious country but the highest incidence of the disease lay between mile 147 (in Kalahandi ex-State) and mile 223 (the boundary of the new Orissa Province, formerly the old Agency limit). On this length it was quite exceptional to find a village with a child splenic index of under 70 per cent. The only town, Rayagada, had an index of 39 per cent.

Out of the 44 species of Anopheline Mosquitoes found within the Indian Empire no less than 23 have now been found in the district. These are—

- Anopheles aitkeni*—James
- A. hyrcanus nigerrimus*—Giles
- A. barbirostris* v. d.—Wulp
- A. vagus*—Donitz
- A. subpictus*—Grassi
- A. culicifacies*—Giles
- A. fluviatilis*—James
- A. varuna*—Iyengar
- A. minimus*—Theobald
- A. aconitus*—Donitz
- A. jeyporiensis*—James
- A. moghulensis*—Christophers
- A. maculatus*—Theobald
- A. theobaldi*—Giles
- A. karwari*—James
- A. majidi*—Mccombe Young and Majid
- A. splendidus*—Koidzumi
- A. stephensi*—Liston
- A. tessellatus*—Theobald
- A. jamesi*—Theobald
- A. annularis* v. d.—Wulp
- A. philippinensis*—Ludiow
- A. pallidus*—Theobald

*The Panama Canal, the largest Engineering work, on which anti-mosquito measures had been taken before, is only 46 miles in length.

Formidable though this list appears only the three closely related species *fluviatilis*, *varuna* and *minimus* appear to play any considerable part locally in the transmission of malaria. The elsewhere notorious *A. Culicifacies* is the preponderating species of the Anopheline fauna, but has recently, as the result of extended researches, been shown to play little or no part in the etiology of malaria in these hills. The cause of this exceptional phenomenon is not yet known. However, the three definitely incriminated species swarm as larvae, in every small stream and seepage trickle, and in rice fields wherever springs and seepages keep the water cool and in the slightest degree in motion. Rice fields of this nature are general throughout the district. Not only is the numerical output of the vector species very large, but their infective rate is also extremely high, averaging 3·6 per cent, over the year in the Bissam-katak taluk.

It was therefore obvious that unless malaria could be controlled the massing of imported, non-immune labour for building the railway was going to result in a disaster of the first magnitude. Such labour is housed in temporary brushwood huts, is quite undisciplined and incapable of being treated with quinine as a routine measure, and must be protected in spite of itself from all forms of epidemic disease. It was thus certain that malaria protection could only be achieved by attacking the disease in the mosquito, and not in man.

The problem was solved by compelling the earthwork contractors to locate their labour camps on pre-selected sites arranged between the engineering and the medical departments, instead of allowing their labour to camp at will all along the route. Two camp sites to every three miles was the standard aimed at, though this naturally varied in practice according to the amount of work involved on each length. After making the necessary concessions in regard to convenience for work and availability of drinking water, the sites were chosen primarily to minimise the amount of water needing treatment within a circle centred on the camp and with a radius of half a mile, the effective flight range of most Anopheline mosquitoes. All dangerous water within each protected circle was then oiled weekly so long as the camp was occupied, while new sites could not be occupied until certified safe by the Malariologist, as when taken up for treatment they were naturally full of the winged forms, though sites were chosen as far from villages as possible to minimise the number of the latter likely to be infected by feeding on the local inhabitants.

In practice, it was far from simple to arrange and supervise such an organisation. The Sanitary Inspectors had absolutely no practical experience of mosquito control. Owing to bad roads and long distances, these men had perforce to be left unsupervised for days at a time. The work involved was very hard physically, and when it is borne in mind

that a week's neglect of some breeding place always leads to the emergence of a brood of mosquitoes, it is difficult to give too much credit to the two Chief Malaria Inspectors who were so successful in keeping the ordinary Inspectors up to their work. Much weeding out of unsuitable Inspectors was necessary, but towards the close of the construction a quite reliable force was achieved.

By these means malaria was kept down to a daily sick rate of under two per cent (though the figures could never be collected with any real accuracy), and there was a very little bolting of gangs. The Sub-Assistant Surgeons in charge of clinical measures were constantly on patrol over their twenty-mile lengths, and reported to the malaria staff any camp in which their inspections showed any abnormal malaria incidence. What would have happened without such measures was well revealed when, for any reason, a protection went wrong. Two bad instances of such a happening occurred, one at Solawa village, South of Jimidapeta Station, the other at the crossing of the Vamsadhara river, near Ambodala. General sickness and incapacitation, accompanied by deaths in spite of quinine treatment, at once appeared.

The cost of this organisation was, in comparison with the total amount expended on the construction, small. Very small, in comparison with what the railway had spent in excess of estimates for enhanced rate in a previous construction where malaria had played havoc with the work. The amount expended on purely anti-malarial operations cannot be disentangled in the accounts from the total expenditure on medical services which included a base hospital and a District Medical Officer, but the entire medical expenditure only amounted to 0·8 per cent of the total cost of the whole 242 miles constructed.

When construction works were completed, the question of how to maintain the open line had to be considered. It was obvious that non-local staff could not be maintained in health without measures at least as effective as these used for guarding the health of the construction force, yet an expenditure which for such a force was *per capita* reasonable, became on the same basis very high where the staff of a small roadside station only is involved, yet the area to be controlled to protect a staff of two station-masters and six pointsmen is no smaller than to protect five hundred coolies camped at the same spot. In fact, for a small staff, such measure must be of even higher efficiency, for sickness of small stations may involve continuous duty for some man until relief can arrive. Anti-larval measures were therefore continued around the following stations in this district : Jimadipeta, Rayaghada, Singapur Road, Theruvali, Satikona summit (since renamed Bissamkatak), Muniguda and Ambodala. In addition Langighar Road, just over the district frontier in Kalahandi States, had also to be protected.

Anti-larval measures by oiling, and by Paris green dusting after this larvicide became available in 1928, have continued, and must continue, indefinitely, if this length of the railway is to be kept open for traffic. Yet they are unsatisfactory as routine, in that they depend so greatly on the intensely fallible human factor, and the never-ending annual expenditure leaves no permanent results behind it, so that, if such measures are withdrawn malarial conditions return almost immediately to the *status quo ante*, and if they have been in force long enough to result in the growth of a child population not immunised by exposure to infection from birth, cessation must lead to a devastating epidemic among the children. The policy of the railway, is therefore, as far as possible, gradually to change over to permanent anti-larval measures, filling in of burrow pits and sub-soil drainage principally. In this district, the best examples of sub-soil drainage are in the *dhobi* ravine at Rayaghada, though there are lengths at other stations. Nonetheless there remain vast areas of breeding grounds quite unsusceptible to such works, which must remain under regular larvicidal treatment until further research into biological methods of control yields a solution for such problems. Then, and not until then, will it be possible to do anything for the malaria of the district generally, for sums that can be economically justified by an industrial concern to protect keymen cannot possibly be contemplated when village economies are under consideration. A biological method of control, after the rains are over, for small volume streams which during the rains run in such force as to wash out sub-soil drainage, has been evolved, but for larger streams and main irrigation channels, and above all for the immense seeping rice areas that occur everywhere, such methods are still to seek. Until such are found, these eight railway stations must remain inlets of safety in the vast sea of malaria which is this district.

To illustrate what has been accomplished by the railway for its own staff, the combined annual dispensary figures for the eight stations mentioned above, average for the two calendar years 1934 and 1935 are as under :

Railway population (including dependants)	..	1,015
Cases treated, all diseases	..	4,128
Cases treated, malaria only	..	116
Percentage of malaria to all diseases	..	2.8
Percentage of population attacked with malaria annually		11.4

Whilst these figures show that even with such measures the stations are not entirely free, they do indicate that imported plains staff can carry on their duties under tolerable conditions of health.

It is only at Rayaghada that a large non-railway population shares in the benefits of the railway's anti-malaria work, a population sufficiently large to enable the effect of these measures to be estimated in terms of reduction of splenic index. The figures* for the children of this town are eloquent of what has been accomplished.

Child Splenic Index, Rayaghada School

1925	..	39.3
1929	..	22.6
1930	..	9.4
1932	..	9.2
1934	..	10.2
1935	..	8.7

Indices of under ten per cent are classed as 'healthy' in the classification of the Malaria Survey of India. The rest of the district is, almost without exception, in their class 'Hyperendemic'.

The problem of malaria in the district is one of increasing difficulty. Before the railway came, the villagers grew rice enough for their own needs. Now they grow for export. Where perennial irrigation is available, fields are now cropped continuously, and new fields are always being levelled up. All this means more Anopheline production, and further in the Bissamkatak taluk at least, the provision of perennial irrigation means continuous malaria transmission of the disease occurs. The perennial irrigation at Satikona summit makes this station so exposed to attack that eight years' work have made not the smallest impression on the 96 per cent splenic index of the village behind the station, where the staff are only maintained by supplementing anti-larval measures by daily spraying of their quarters with insecticides to kill off such adult mosquitoes as have escaped destruction in treating the 239 acres of rice land lying within the protection circle, or have infiltrated from beyond it, and by bi-weekly quininization. Yet adequate usage of the district's large water supplies to make use of its high soil fertility must be the object of every administrator. A rice experiment station, to investigate how to grow this crop locally without at the same time creating further malaria, is a great *desideratum*."

* By 1939 the spleen-rate at Rayaghada had fallen to 3.6.