

A REPEATED LEPROSY SURVEY IN SOUTHEASTERN NIGERIA

THE PROGRESS OF UNTREATED CASES OF LEPROSY

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In September, 1937, a leprosy survey was undertaken at Etitama, Nkporo, in the Bende Division of southeastern Nigeria. The area surveyed was the largest of a group of villages which comprise the district of Nkporo, lying at the northern edge of the belt of tropical forest which extends across Nigeria. Grassland becomes general a few miles farther north. The climate is tropical, with a temperature varying between 70° and 95°F. throughout the year. The seasons are well defined, the wet season lasting from April to October, with a relatively low mean temperature, and the dry season lasting from November to March, with high temperatures. The rainfall is heavy and occurs almost exclusively during the wet season.

The village of Etitama is in undulating country and is built on a hill at a height of about 400 feet. Surrounding it there is an area of lowland, badly drained and swampy in the wet season. The soil is sandy and of poor quality, with outcroppings of laterite in many places. A light soil, heavy rainfall and primitive farming methods have combined to cause considerable deterioration in the fertility of the soil.

The village is situated in one of the least developed areas of Nigeria, in a region where leprosy is known to be rife. It would be difficult to imagine conditions more favorable for its spread. The people live crowded together in compounds each of which consists of a circle of mud-and-wattle huts, small, dark, unventilated and unhygienic. Sanitary conditions are most primitive. The water supply consists of a single stream about one-half mile away from the village. Latrines are open and untrenched, rubbish is deposited without system, and domestic animals have free access to the houses.

The diet of the people is mainly vegetarian, consisting of

yams, cassava, palm oil, maize, bananas and oranges, with a little goat meat eaten on festive occasions. Vitamin deficiency is common in the neighborhood, and during the months of May, June and July the diet is most unsatisfactory.

In spite of the primitive conditions the discipline of the village is excellent, and the people are eager for progress. Leprosy is regarded with considerable dread, due largely to religious beliefs concerning it. The people are aware that segregation of lepers is a necessity, and approximately ten years ago they built a village for them about one-half mile from the parent village; all persons with advanced leprosy were expected to live there. It was the presence of this indigenous leper village which first attracted my attention, and after one or two visits the chiefs readily agreed to a survey of the whole population.

The chief obstacle confronting survey work in Nigeria is the lack of accurate records of the population. No official census has been taken, and if it were attempted the people would conceal members of the clan, as they resent the publicity of such knowledge as is revealed by a census. The results would therefore be most unreliable. In survey work we are dependent upon the cooperation of the people; and only if this is good, and tact and patience are exercised, can reliable results be expected.

THE 1937 SURVEY

The survey at Nkporo was undertaken by a trained staff, with bacteriological control of the cases and suspected cases of leprosy. The method adopted was to visit each compound in turn and examine all the people living in that compound, and when that was completed the next compound was visited. During the examination the age and sex of each person were recorded and the existence of absentees was elicited by questioning. The chiefs, who were enthusiastic about the survey, always accompanied us and were able to vouch for the accuracy or otherwise of the information given in each compound.

When presenting themselves for examination the people were either entirely stripped or wore only a minimal loin cloth. Each person was examined by two trained workers. All cases of leprosy, both those in Etitama itself and those segregated in the leper village, were carefully examined and the type of the disease and the sites and extent of the lesions were recorded, together with the bacteriological findings. The numbers and age grouping of the population examined are given in Table 1.

Incidence of leprosy, 1937.—In the leper village there were found 42 cases from Etitama, while 65 unsegregated cases were discovered living in Etitama itself. The total of 107 cases gave a general leprosy incidence of almost exactly 6 percent. Details of the cases are given later.

TABLE 1.—Population surveyed in 1937.

Sex	Age groups									Total
	0-4	5-9	10-14	15-19	20-29	30-39	40-49	50-59	60+	
Males.....	230	104	62	35	44	85	108	40	13	721
Females...	270	139	62	56	144	204	102	38	26	1,041
TOTAL ..	500	243	124	91	188	289	210	78	39	1,762

Subsequent to this survey occasional visits were paid to Etitama. The chiefs were given the names of all unsegregated lepers and were told which of them were most infectious, but nothing further was done until the spring of 1939 when a clinic was opened at the leper village. In the interim the complete confidence of the people had been gained, and it was believed that a resurvey would yield interesting information as to the progress of the disease in those suffering from it, and also would indicate the rapidity of the spread of leprosy in the village.

THE 1939 SURVEY

This survey was undertaken in June, 1939, and was very thorough. The people had no objection to a full census being carried out, and that was done. The entire village was examined, not simply compound by compound, but from house to house. The name and approximate age of every person were recorded. As far as possible every person was accounted for. The names of all absentees were taken and, apart from those away at a distance, they were seen during subsequent weeks. The examination of each individual was similar to that carried out in 1937, men being stripped and women wearing the minimal loin cloth. The cooperation of the people was excellent.

Conditions in the village were found to be similar to those prevailing in 1937. I was impressed by the enormous incidence of diseases other than leprosy. Yaws and dermatitis were almost universal among the children, while anemia, malaria, tropical ulcers and spinal caries were not uncommon.

All cases of leprosy were again carefully examined, with bacteriological control, and as far as possible all of the cases

seen in 1937 were traced. Several people had died in the leper village on account of an epidemic of smallpox in 1938.

Before the end of the survey it became apparent that the method of house-to-house visitation is the only one by which reliable results can be expected. There were discovered 14 lepers who were absent in 1937 but who acknowledged that they were suffering from leprosy then. As free treatment is now available there was no impulse for persons with leprosy to hide themselves during the 1939 survey. It was also revealed that two lepers had given incorrect information and were not actually natives of Etitama. If the leprosy incidence is adjusted to accord with these findings, the 1937 incidence rises to 6.8 percent.

The returns for the population examined in this survey are given in Table 2. These figures do not include 56 people who were away from their homes at a distance, and who will be examined as they return during the next year or so.

TABLE 2.—Population surveyed in 1939.

Sex	Age groups								
	0-4	5-9	10-14	15-19	20-29	30-39	40-49	50-59	60 +
Males....	326	165	44	22	78	108	77	29	37
Females...	224	136	54	18	197	257	76	23	21
TOTAL..	550	301	98	40	275	365	153	52	58
									1,892

Incidence of leprosy, 1939.—At Etitama 108 cases of leprosy were seen and examined, and if four cases are included who were sent to the Uzuakoli Colony after 1937, the incidence in a population of 1,892 people examined is 5.7 percent.

CASES OBSERVED

Data on all of the cases that were seen in 1937, and their status in 1939, are shown in Table 3. The ages given are approximate; the classification is that of the Cairo congress. The skin lesions of the macular neural group are of the usual flat pale kind. A large majority of the patients were from Etitama, but 16 of them (marked *) were from elsewhere, living in the leper village in 1937. Four cases (marked †) have been sent from the village to the Uzuakoli colony since 1937. It was found in 1938 that 18 patients had died (among them four from other villages), and 4 could not be traced.

Not included in this table are the 14 cases that were leprosy in 1937 but not seen then, and the 10 new ones that have

TABLE 3.—Cases seen in 1937; status in 1939.

Case groups and cases			Classification, 1937	Progress observed in 1939
No.	Sex	Age		
<i>Lepromatous (a) with nodular lesions</i>				
1	F	9	L1	Much worse
2	F	40	L2	Worse
3	F	40	L3	Worse
4*	F	34	L3	Worse
5*	M	30	L3	Worse
6*	M	10	L3	Little change
7*	M	45	L3	Little change
8	M	38	L2	Little change; diffuse
9	M	9	L2	Little change; diffuse
10	F	35	L3	Died
<i>Lepromatous (b) with diffuse infiltration</i>				
11	F	42	Ld2	Worse
12	F	35	Ld2	Worse
13	F	13	Ld2	Worse
14	F	9	Ld2	Worse
15	F	11	Ld2	Some resolution
16†	M	25	Ld3	Slightly improved
17†	M	16	Ld2	Improved
<i>Lepromatous (c) with macular lesions</i>				
18	M	22	L2	Worse
19*	M	35	L2	Worse
20*	F	50	L2	Little change
21	F	33	L2	Little change
22	M	28	L2	Little change
23†	M	28	L1	Much improved
24	F	32	L2	Resolving
25	F	26	L2	Resolving
26	M	64	L2	Resolving
27	F	35	L2	Died
28	F	38	L2	Died
29	M	35	L3	Died
30*	F	35	L2	Died
31*	F	25	L2	Died
32*	M	30	L2	Died
<i>Neural (a) macular</i>				
33	F	36	Ns2	Worse; B+
34	F	27	Ns3	Worse
35	F	35	Ns2	Worse
36	F	29	Ns2	Worse
37	M	7	Ns2	Worse
38	F	25	Ns1	Little change
39	F	36	Ns2	Little change
40	F	56	Ns1	Little change

TABLE 3.—Cases seen in 1937; status in 1939 (cont.)

Case groups and cases			Classification, 1937	Progress observed in 1939
No.	Sex	Age		
41	F	32	Ns2	Little change
42	F	29	Ns2	Little change
43	F	39	Ns2	Little change
44	F	27	Ns1	Little change
45	F	25	Ns1	Little change
46	F	35	Ns1	Little change
47	M	39	Ns2	Little change
48*	F	55	Ns2	Little change
49*	F	48	Ns2	Little change
50*	F	42	Ns3	Little change
51*	F	28	Ns3	Little change
52	F	30	Ns1	Little change; tuberculoid
53	F	25	Ns2	Little change; tuberculoid
54*	F	30	Ns2	Little change; tuberculoid
55	M	28	Ns2	Resolving
56	F	40	Ns1	Resolving
57	M	25	Ns2	Improved; tuberculoid
58	F	35	Ns2	Improved
59	F	35	Ns2	Improved; tuberculoid
60	F	35	Ns1	Fully resolved
61	F	35	Ns2	Died
62	F	4	Ns1	Died
63	F	55	Ns2	Died
64	F	35	Ns1	Has left neighborhood
65	M	5	Ns1	Not traced
66	F	35	Ns2	Has left neighborhood
67	F	25	Ns2	Has left neighborhood

Neural (b) minor tuberculoid

68	M	60	Nt2	Much worse; lepromatous
69	M	45	Nt1	Worse; B+
70*	F	26	Nt2	Worse; flat macules
71*	F	38	Nt2	Worse; flat macules
72	F	42	Nt2	Worse
73	M	38	Nt2	Worse
74	F	3	Nt1	Worse
75	F	40	Nt1	Worse
76	M	35	Nt1	Worse
77	F	35	Nt1	Worse
78	F	40	Nt1	Worse
79	F	35	Nt1	Worse
80	M	50	Nt1	Worse
81	M	32	Nt1	Worse
82	M	45	Nt2	Worse
83*	F	42	Nt2	Little change

TABLE 3.—Cases seen in 1937; status in 1939 (cont.)

Case groups and cases			Classification, 1937	Progress observed in 1939
No.	Sex	Age		
84	F	41	Nt2	Little change
85	M	62	Nt2	Little change
86	M	30	Nt1	Little change
87	F	40	Nt1	Little change
88	F	42	Nt1	Little change
89	F	30	Nt1	Little change
90	F	36	Nt1	Little change
91	M	35	Nt1	Little change
92	F	30	Nt1	Little change
93	F	45	Nt1	Little change
94	F	37	Nt2	Resolving
95	F	35	Nt2	Resolving
96	F	43	Nt2	Resolving
97	M	60	Nt1	Resolving
98	M	50	Nt1	Resolving
99	M	45	Nt1	Resolving
100	F	40	Nt1	Resolving
101	F	10	Nt1	Resolving
102	F	35	Nt1	Resolving
103	F	35	Nt1	Fully resolved
104	M	38	Nt1	Resolving
105	F	38	Nt1	Resolving
106	F	35	Nt1	Resolving
107	F	33	Nt1	Resolving
108	F	28	Nt1	Resolving
109	F	35	Nt2	Resolving
110†	M	18	Nt2	Resolved
111	M	35	Nt1	Died
112	F	35	Nt1	Died
113	F	28	Nt1	Died
114	M	55	Nt1	Died
115	M	25	Nt1	Died
116	M	35	Nt1-2	Died
117	F	65	Nt2	Died
118	F	50	Nt2	Died
<i>Neural (c) major tuberculoid</i>				
119	F	39	Nt2	Worse; B+
120	M	8	Nt2	Worse
121	M	35	Nt1	Little change
122*	F	50	Nt2	Little change
123	M	7	Nt2	Resolving
124	M	75	Nt1	Resolving
125*	M	30	Nt2	Resolving

* Patients from other villages than Etitiama.

† Patients transferred to the Uzuakoli Colony.

developed since that time. Of the former of these groups, four are lepromatous (all L2) and ten neural; the latter include five minor and two major tuberculoid. Of the latter of these groups, three are lepromatous (all L2, with macules), while of the seven neural cases one has only a single flat pale macule (Ns1) while the others are minor tuberculoid (Nt1).

COMMENTS

A repeated survey offers unique opportunities for observing the progress of untreated cases, especially as it gives a complete picture of the leprotic infection in the area surveyed. It also affords opportunities for comparing methods of survey. From these points of view the surveys described are of interest. As it is desired to draw attention only to certain aspects of them, standard epidemiological data are not presented. They can easily be deduced from an analysis of Table 3.

PROGRESS OF UNTREATED CASES

It is not always easy to judge the progress of a case of leprosy. A number of factors have to be considered, and each case must be judged on its merits. The following factors were taken as a guide in the cases under review.

Signs of deterioration.—(1) The spread of lepromatous infiltration, and the appearance of new nodules or lepromatous macules. (2) In advanced lepromatous cases with generalized lesions, a deterioration in the general condition. (3) Bacteriologically negative cases becoming positive, and also a marked increase in the number of bacilli in cases already positive. (4) Increase in size of active neural macules. (5) New activity in quiescent macules. (6) Increase in number of neural macules. (7) Extension of anesthesia.

Signs of improvement.—(1) Bacteriologically positive cases becoming negative, and also a marked diminution in the number of bacilli in cases already strongly positive. (2) Diminution in thickening and erythema in lepromatous lesions, provided it is associated with diminution in the number of bacilli. (3) Resolution occurring in active neural macules, so that they become quiescent or residual. (4) Diminished anesthesia. (5) Increased cell response in active flat neural macules, so that they take on tuberculoid appearances.

It will be seen that estimates of progress were made on clinical and bacteriological grounds alone. Field work of this nature

did not provide opportunities for the use of such valuable laboratory aids as the lepromin test and the sedimentation index.

Altogether, 118 untreated cases were traced. Of these, 18 had died, several of them because of conditions other than leprosy; six deaths were due to smallpox. The progress of these cases is shown in Table 4, in total and according to the type of the disease. Of the 28 improved cases, 2 are fully resolved; of the 33 that are worse, 1 is much worse.

TABLE 4.—*Progress of the cases, according to the type of the disease.*

Progress	Lepromatous			Neural			Totals
	Nodular	Diffuse	Macular	Simple macular	Tuberculoid		
					Minor	Major	
Died	1	—	6	3	8	—	18
Worse	5	4	2	5	15	2	33
Stationary	4	1	3	17	12	2	39
Improved	—	—	3	6	16	3	28
TOTALS	10	5	14	31	51	7	118

These results are of considerable interest. They indicate that in southeastern Nigeria, a highly endemic area, leprosy in many cases takes a chronic course, and that there is a marked tendency to self healing; no less than 67 percent of cases either remained stationary or improved during the two-year period. The tendency towards resolution is most marked among tuberculoid cases, decreases in those with flat neural macules, and is absent in the active lepromatous ones; but it does not depend solely on the type of the disease which has been acquired. The decisive factor appears to be the resistance of the patient to the bacillus. This is a fluctuating quantity even in a single individual, for a person may acquire a form of the disease such as the tuberculoid one, which is associated with a good resistance, and then show advancement of the disease when his resistance falls, whereas a person with low resistance in whom the disease presents lepromatous macules may show considerable improvement with heightened resistance.

INCIDENCE OF THE DISEASE

The incidence of leprosy in the village surveyed is extremely high and the disease is still active, ten new cases having developed during the two years between the surveys. In this connection it is of interest to note that a lepromatous individual who was absent during the 1937 survey later returned to her

home, and three of the new cases, including two lepromatous ones, have occurred in the immediate neighborhood.

Apart from the segregation of very obvious lepromatous cases, no steps were taken by the people to deal with the leprosy problem. Many cases were still living in the village at the time of the 1939 survey. Active control measures are now being taken, and treatment is being given. All infectious lepers have been segregated and are living happily in a model village which they built themselves under careful supervision. The result of segregation, combined with the educational effect of the model leper village on the nonleper population, will be estimated by another survey in two years time.

This survey illustrates the fallacies which are so often associated with leprosy work. In 1937, 14 cases were not seen, and probably 100 of the villagers escaped examination in spite of the care which was taken and the obvious cooperation of the chiefs. By 1939, the good will of the common people also had been gained; a full census was taken and, what is most important of all, the survey was made from house to house. Women were examined in the privacy of their own homes, and there were no attempts at concealment or reluctance to permit the examination of the entire body surface. By these methods far more accurate information was obtained than previously.

The incidence of leprosy has fallen from 6.8 percent to 5.7 percent. With the segregation methods now in force and the constant supervision which is exercised, it should now fall rapidly.

These results give grounds for encouragement. The village surveyed does not differ from numerous others in southeastern Nigeria in respect of its high leprosy incidence and extremely favorable conditions for the spread of the disease. It is unusual in the degree of the "leprosy consciousness" of its inhabitants, and thus it offers a favorable locale for control work.

The facts that even in the absence of control work the incidence of the disease is decreasing, and that a proportion of the cases have a tendency to self healing, indicate that in this country, with its high incidence of leprosy and low financial resources to fight the disease, the problem though acute is not insurmountable. It is hoped by similar investigations elsewhere to discover whether experience at Nkporo holds good in other areas.