



# INTERNATIONAL JOURNAL OF LEPROSY

VOLUME 28, NUMBER 1

JANUARY-MARCH, 1960

## THE ROLE OF LEPROSARIA AND TREATMENT VILLAGES IN MASS CAMPAIGNS IN TROPICAL AFRICA<sup>1</sup>

J. A. KINNEAR BROWN, M.D., B.Sc., D.T.M.

*Specialist Leprologist  
Entebbe, Uganda*

### DEVELOPMENTS IN NIGERIA

My introduction to leprosy was in Southern Nigeria in 1930, when I was asked to take over the building at Uzuakoli of a settlement that had been projected three years earlier. At that time there was little information about the pattern of the disease in its West African environment; one had to learn slowly from experience. As I do not think the relative parts that leprosaria, treatment villages and clinics have subsequently played can be seen in perspective unless viewed against their natural background, I propose to outline the circumstances in which they developed.

Knowledge of the disease itself was somewhat vague at that time, and the first attempt at an international classification<sup>(9)</sup> had not yet been made; the word "classification" was not in the textbook of Rogers and Muir<sup>(11)</sup>. Treatment usually implied chaulmoogra (hydnocarpus) oil or its derivatives, but opinions about their value differed, and other drugs also had their advocates. However, because of supply difficulties it often happened that the drug used was the one which was available.

The diversity of conditions in different countries regarding the existence of leprosy laws and their enforcement where there were any, in the attitudes and practices regarding segregation, and in views regarding treatment and the curability of leprosy, are reflected by a report of Burnet of the League of Nations<sup>(4)</sup>. In tropical Africa, which he did not visit, there were of course almost no provisions at all for control.

<sup>1</sup> By permission, this paper is based on a working document prepared for the WHO/CCTA Conference on Leprosy in Africa, held in Brazzaville, F.W.A., April 14-21, 1959.

The disadvantages of compulsory segregation, which promoted concealment and delayed diagnosis and treatment, were recognized by the Leprosy Commission of the League of Nations (<sup>8</sup>). It proposed that the term "segregation" be replaced by "isolation"—isolation remaining one of the essential measures in the prophylaxis of the disease.

In some countries the principle of voluntary admission was gaining ground, and there was thinking in terms of treatment leprosaria where the atmosphere would lead patients to seek admission. The tendency then developed of regarding leprosaria as the only answer.

The introduction of Alepol by Rogers contributed largely to the expansion of activity in the British Commonwealth. This was not because it had proved superior to other preparations, but as it was a solid of small bulk it overcame the transport difficulties which had limited the use of hydnocarpus oil. The more inaccessible hospitals were now able to treat patients, while those which had struggled with erratic supplies of oil found their scope increased. In Southern Nigeria beginnings were made at Itu, Etinan and Uburu. At Itu many patients squatted near the general hospital, thus beginning the settlement which eventually became the largest in Africa. Uzuakoli followed, Oji River came next, and later others elsewhere in Nigeria.

The opening of Itu and Uzuakoli demonstrated how false was the previously-held idea that leprosy was uncommon in the southern provinces. The hope of cure broke through the barrier of secrecy that the people with leprosy had maintained, and it became evident that this was one of the most heavily infected parts of the world. In my search for a site for the Uzuakoli Settlement I had seen villages in which every inhabitant suffered from leprosy—the result of the emigration of the uninfected from existing villages, or of the creation of new villages by those who had neither peace nor security at home.

Uzuakoli was quickly filled to capacity. Waiting lists were kept at district headquarters, and patients were admitted in quotas based on the contributions of the various local administrations. The number of places was increased by the inclusion of patients who could maintain themselves for a year before becoming dependent on the settlement. However, there were some 75,000 cases in Owerri Province, and we were treating 1,100. Uzuakoli was only a small drop in a large ocean.

In 1930 it would have cost £250,000 to build leprosaria to accommodate all the patients in the province, and a similar sum each year for upkeep. If the money could have been obtained, sufficient land and staff would not have been procurable. Since the treatment then available (chaulmoogra) would have given permanent benefit to relatively few, the main advantage would have been the isolation of a greater number of cases. This realization led to the next step, for—although difficult to cure—the disease could be prevented.

In 1935 a Church of Scotland missionary wrote about the plight of the people with leprosy in one of the districts, where three "leper

villages" had been established by the patients themselves. These places were isolated from main roads so that doctors could not go to them to give treatment, and there was no place where the patients could get treatment if they should travel periodically to the nearest road. This ultimately led me to recommend <sup>(1)</sup> the basis of control in Southern Nigeria should be the establishment of provincial settlements or leprosaria (one to a province), and the creation of a system of dispensaries (local clinics) attached to special satellite villages in which the patients should live, one such special village to be created for each group of compounds.

The idea was that if some had built new villages, why should not all do so. An effort would be required to obtain the land and the cooperation of the people, because they were generally afraid, unsympathetic or hostile; but there appeared to be no other way. The scheme which developed, and which ultimately achieved such success under Dr. T. F. Davey <sup>(5)</sup>, was thus a natural evolution from within. The effect was a degree of segregation, and an organization and system which, when the sulfones were introduced, permitted their widespread application in an effective way <sup>(6)</sup>.

#### POLICY IN UGANDA

Although Nigeria and Uganda lie almost within the same latitudes, conditions are different. In Southern Nigeria the people live huddled together in compounds and villages at nearly sea level, in an atmosphere that is hot and damp. Uganda has no villages and, at 4,000 feet, the people enjoy a more equable climate. The family is the unit, each being isolated from the neighbors by their farms. Numerous surveys had shown that Uganda contained, among its 5½ million inhabitants, 70,000 leprosy cases, of whom 19 per cent were children, 9 per cent lepromatous, the sexes being equally affected.

In 1951 Uganda had five leprosaria, four built twenty years earlier and one of recent origin. Four were on the fringes of the territory, Buluba and Nyenga on or almost on the shores of Lake Victoria, and Bunyoni and Kuluva close to the western boundary. Only Kumi-Ongino was at all central. Together they accommodated 2,000 inpatients and treated, possibly, as many outpatients. Despite their excellent work it is doubtful whether they were having any significant impact beyond a radius of twenty miles. The capital cost of accommodating all the Uganda patients in leprosaria would have been £2,000,000, and the upkeep £750,000; and, of course, neither sufficient land nor staff would have been available.

The dispersal of the population makes for difficulties in curative medicine. No matter how many hospitals may be provided, large numbers of people will still be too far away to be benefited by them. The numbers of patients who would be living at various distances from a treatment center built in an area with 60 inhabitants per square mile

and a prevalence rate of 15 per 1,000 (figures near the average for leprosy in Uganda) are as follows:

<i>Radius in miles</i>	<i>Number of patients</i>	<i>Number living between miles</i>	<i>is</i>
1	3	0 and 1	3
2	11	1 and 2	8
3	25	2 and 3	14
4	45	3 and 4	20
5	71	4 and 5	26
10	283	5 and 10	212
15	635	10 and 15	352
20	1,130	15 and 20	495
25	1,765	20 and 25	635

If nobody lived more than 10 miles from a treatment center, of the 283 patients within that radius:

11, or 4%, would have to travel 2 miles or less to the center, with a return journey averaging 3 miles;

14, or 5%, would have a return journey averaging 5 miles;

20, or 7%, a journey averaging 7 miles;

26, or 9%, a journey averaging 9 miles; while

212, or 75%, would have a return journey of anything between 10 and 20 miles.

The percentages would be the same whatever the density of population or the prevalence of the disease. These figures suggested that a service confined to outpatient clinics could achieve only a limited success. An analysis of 410 discharges from two leprosaria during 1957 showed that the duration of treatment before discharge was significantly less for the inpatients than for those attending the same centers as outpatients, despite the fact that inpatients usually include the more serious cases. The following figures are the percentages of patients discharged whose treatment had lasted:

	<i>2-3 years</i>	<i>3-4 years</i>	<i>4-5 years</i>	<i>&gt;5 years</i>
Inpatients (111)	20	22	28	31
Outpatients (299)	7	19	33	41

Uganda has, therefore, adopted a policy of treatment villages linked, as far as possible, to leprosaria and supplemented by outpatient clinics. As in Nigeria, it has been a logical development and not an imposition from outside. In Nigeria the segregation of the village was the answer to ineffective treatment; in Uganda it is a convenient way of establishing continuity.

#### MASS CAMPAIGNS OF SETTLEMENTS, TREATMENT VILLAGES

Mass campaigns against leprosy as practiced in this part of Africa, and the settlements and the treatment villages which are discussed, are in many respects so foreign to the experience of people in other parts of the world that it may well at this point to diverge for a bit and say something about them.

Mass campaigns are attempts to deal with particular diseases on the widest possible scale, using whatever means the economy of the country will allow. Smallpox vaccination, diphtheria inoculation, and the fight against venereal disease in modern civilization are types of mass campaigns. These are operated by public health departments and medically qualified practitioners. In many parts of the world it is necessary, in mass campaigns, to rely on semiskilled and "paramedical" personnel, and the treatment has to be given according to a routine fixed by a central organization. Mass campaigns, therefore, attempt to bring the largest possible number of patients under a regimented form of treatment within the shortest possible time. It is obvious that they have their advantages and limitations.

A leprosarium in our part of the world is generally a settlement or farm colony of patients living in huts or houses frequently made only of temporary or semipermanent materials. The administration offices, the laboratory, the wards and the operating room are preferably made of cement block or brick, but they are of simple and utilitarian design. Leprosaria in tropical Africa are never elaborate institutions.

A treatment village is almost always constructed of local materials, and is built by the community for patients to permit them to be treated readily. It is a typical African village, but with certain refinements that are possible when built according to a plan and not left simply to "accumulate" as more and more inhabitants are added. It is located within the area occupied by the community, so that the patient is not isolated from the stream of life but is at all times in touch with the activities and interests of his kith and kin. The object of the village is to provide for continuity of treatment, without the interruptions resulting from travel from distant homes. The patients derive their food from their own farms at the village, assisted by gifts from their families and, when necessary, supplemented by the local council. Patients living in the village who need special treatment go to the corresponding leprosarium to get it.

#### DEVELOPMENT OF THE SYSTEM

In the last seven years 80 treatment villages have been built in Uganda, and an outpatient clinic is associated with each of them. There are now very few parts of the country where a person with leprosy need be without treatment and accommodation. This has not been accomplished easily.

Propaganda has been necessary, and has included booklets in the vernacular languages illustrated with local photographs, posters explaining the purpose of the treatment village or showing the beneficial effects of treatment on Uganda patients, and exhibitions at county shows of photographs and home-made film strips demonstrating all phases of the work, the emphasis all the time being on local conditions and circumstances.



Surveys consisting of the examination of every person in selected areas have preceded the location and building of the villages. They have determined what would be necessary, and provided the opportunity for discussions with the local chiefs and other authorities and with the people. These explanations are extremely important and should never be hurried or omitted, especially those with the people who have allowed themselves to be examined and who are going to give the land and do the work. I have regarded them as the most effective part of all our propaganda. The time of the actual survey, with the results of the examination known and the patients present, is the decisive moment for gaining the confidence of the people and impressing upon them what it is hoped they will do.

Further regarding surveys, it should be pointed out that the epidemiologic work in Uganda has been based on the examination of whole-population samples. First a complete census of the area is taken by the health staff. The examinations are made in simple, communally-built enclosures, one for males and one for females, as shown in Fig. 1. These enclosures measure about 75 x 25 feet, and each is divided—by partitions as simple as the walls which surround it—into three rooms, one for undressing, one for dressing, and a central one where the examinations are made.



FIG. 1. Examining enclosures used in the field surveys in Uganda. One is for males, the other for females; each is divided into three compartments, one for undressing, one for dressing, and the central one for the examination room.

All freedom is given to the people in designing their villages as they wish, within the advice given by the health inspector and the medical and agricultural officers. The essentials laid down are: (1) nearness to a hospital or dispensary to economize staff, transport and time; (2) a satisfactory water supply; and (3) land suitable for cultivation. The general principle is that as many lepromatous patients and infected children as possible should be sent to leprosaria; others are brought

into the special villages together with the nonlepromatous patients who live more than five miles away and who do not possess bicycles; the remainder attend as outpatients. The village is built by communal labor, supervised by the local chiefs, but help is given by the District Council and the Department of Community Development with doors, windows and furniture; and aid is given with respect to food until the farms are producing. It should be emphasized that the village is a communal effort, and it is good psychology to keep it so because what people create they are more inclined to value and preserve.

Examples of such villages in different parts of the country are shown in Figs. 2 to 5. It will be noted that there are differences in preferred construction in different districts, notably with respect to the roof thatching.



FIG. 2. A treatment village in Acholi in Northern Nigeria, just south of the Sudan.

FIG. 3. A treatment village at Serere, in the Teso district.

FIG. 4. A treatment village at Asamuk, in the Teso district.

FIG. 5. A treatment village in the West Nile district, near the Congo border.

The basic problem is twofold: to prevent the production of new cases, and to get the right number of tablets into the right mouths at the right time. The treatment village does this. If patients could be relied upon to isolate themselves at home and could be trusted with bottles of 50 or 100 tablets, the solution would be simple. Unfortunately, home segregation is an illusion, and even educated people fail to take their medicine regularly.

There has been pressure to treat all bacteriologically negative patients at clinics. However, finding the bacillus may depend on the zeal

and patience of the examiner and other circumstances. Then, too, patients who appear to be negative for months suddenly become positive, and there is other evidence to suggest that "closed" cases may carry the infection. The outpatient clinic is, of course, the line of least resistance—less effort is required to establish it—but attendances are bound to become irregular if patients have to travel long distances, and irregular treatment is ineffective treatment. Furthermore, irregular treatment may produce drug resistance; it would be strange if DDS were to prove to be a drug to which bacteria could not become immune.

Mobile clinics have been considered, and may yet be tried. There would still be required 1,200 collecting points in Uganda if no patients would have to make return journeys of more than 10 miles. At least 60 such clinics would be needed, each one visiting 3 or more centers daily and treating 50 to 300 patients at each in order to cover the ground once a week. This distance travelled by 60 mobile clinics, averaging 500 miles a week would be about 30,000 miles, but except in certain areas it would be impossible for mobile clinics to cover the distances involved. Disregarding the initial outlay, the annual cost of transport and personnel would be well over £100,000, a sum out of all proportion to the money available. Even this arrangement would not solve the problem, for in recent investigations it was found that 40 per cent of the patients were unfit to walk more than 4 miles when the conditions were favorable. Fortnightly injections would not appreciably reduce the cost. The number of clinics visited each day would be less, but more personnel would be required. In one area, where fortnightly injections were tried, absenteeism was not reduced; attendances fell to one a month because the injections were painful.

Reports from Brazil <sup>(10)</sup> and the Philippines <sup>(7)</sup> indicate that, in spite of the systems employed, leprosy has not decreased in those countries. On the other hand, in Southern Nigeria there has been an amazing decline, and there is little doubt that the system of control based on the treatment village has been of fundamental importance <sup>(6)</sup>.

The advantages of the treatment village are four: (a) it makes regular treatment possible; (b) it reduces the contact between patients and the rest of the community; (c) it provides a useful social life for a class of people who could easily become apathetic; and (d) it acts as a focus for the communal effort to prevent as well as to treat the disease.

What is feasible in a modern state with a low rate of prevalence and a sufficiency of indigenous doctors is out of reach of countries where revenues can provide only the bare necessities, and only a skeletal medical service can be maintained. Ninety-five per cent of Uganda's population depend upon hospitals staffed by less than 200 doctors. The language of leprosy control in one country may be unintelligible in another. Preventoria, examination of contacts, oral BCG for children, the follow-up of discharged patients and their placing in industry sometimes create envy of countries where such things are possible. Here in



Uganda it once took me three weeks to arrange for the various members of one family to come to a convenient meeting place, a journey of sixty miles to see them, and the best part of a day to examine them. In Nigeria, provided one knew the village where an individual lived, it was not too difficult to locate him; one could often make contact through the market. In Uganda his address might refer to an area of 20 square miles, and one of his acquaintances would have to act as guide through the farms and the bush to his house.

In such circumstances it is necessary to concentrate on essentials. A new ward might mean surgical assistance to more patients, but this has to be weighed against the provision of extra dressers who, by getting drugs to patients who live far away, would prevent larger numbers from ever becoming disabled. In advocating for Uganda a system of treatment villages linked to leprosaria and supplemented by outpatient clinics one is doing no more than adapting resources to particular conditions. It is not a luxury service, it has its imperfections and limitations, but it is producing results; it has in view the safety of the next generation and, founded on the principle of mutual self-help, it should stimulate a sense of civic responsibility which should have useful outlets in other directions.

#### FUNCTIONS OF THE UNITS

The function of the leprosaria in Uganda is that of consulting hospitals. They are staffed by 20 doctors and nurses provided by missionary societies and the British Leprosy Relief Association. Grants are made to them by those organizations and by both central and local governments. The leprosaria give medical supervision to the work of the treatment villages and clinics, and admit from them patients who need surgery or other special care. At two of the leprosaria, two-year training courses are given for people who will subsequently be employed by the local governments in their treatment villages, their District Councils maintaining them during their training. At the same settlements a number of investigations have been carried out, including the development of a modified lepromin test using a depot antigen (<sup>2, 3</sup>).

The purpose of the treatment villages has been described. They need to be large enough to encourage a communal life, but not so big as to be unwieldy; accommodations for 50 to 100 persons is the ideal. The houses are usually built of native materials, but in some areas a nucleus of semipermanent huts has been preferred. Treatment is given twice weekly with oral sulfones by leprosy orderlies who have completed their two years' training. Families are not admitted, the exception being mothers with babies still requiring nursing. Wherever they can be arranged, competitions are promoted by members of the Red Cross Society and prizes awarded for the best farms and the neatest houses and gardens. This society also collects old motor car tires which the patients can make into sandals. The administration of the villages is by the local chiefs and the District Councils.

Outpatient clinics are held at the villages and, with the increasing number of orderlies, it has been possible to open others based on the villages. These reduce the distance patients have to travel. The clinic is visited by the orderly, on a bicycle, who gives treatment once weekly. In a few centers patients come fortnightly, taking home with them a supply of tablets for the week they do not have to attend. The dosage is increased gradually to reach, at the end of three months, four tablets once weekly. This is maintained for four months, then increased to five tablets weekly for five months and six tablets weekly thereafter. Patients who are discharged are allowed to continue treatment if they so desire. Absenteeism after a few months is a major problem, due to the distance that has to be traveled, and it may yet be necessary to introduce an extended bicycle service to take treatment to those who are not able to attend the clinics regularly.

The future is always difficult to forecast, but it is not expected that the treatment village will be a permanent feature. As the numbers of patients needing their accommodation become smaller, some of the villages will fall into disuse with concentration on others conveniently placed. Eventually, and once again, leprosaria will be the only centers with residential quarters. More than that it is not possible to predict.

The expansion of the work has exceeded anticipations and has demanded, and will continue to demand, some flexibility in carrying out the various measures. No account of it would be complete, however, without acknowledgment of the great interest and cooperation shown by all the members of the Medical Department, the Administration and the staffs of the various settlements, and of particular assistance given by UNICEF in the provision of drugs, transport and teaching equipment.

#### REFERENCES

1. BROWN, J. A. KINNEAR. Leprosy in Southern Nigeria; problems of treatment and control. *West African Med. J.* **9** (1936) 10-14.
2. BROWN, J. A. KINNEAR. A modification of the lepromin test. *Leprosy Rev.* **29** (1958) 184-196.
3. BROWN, J. A. KINNEAR and STONE, M. M. The depot lepromin test and BCG vaccination. *Leprosy Rev.* **30** (1959) 110-111; also *Lancet* **1** (1959) 1260-1262.
4. BURNET, E. Rapport sur le voyage d'étude du secrétaire de la Commission de la Lèpre de la Société des Nations en Europe, en Amérique du Sud et en Extrême-Orient. *Rev. Hyg.* **54** (1932) 223 and 299.
5. DAVEY, T. F. Leprosy control in the Owerri Province, Southern Nigeria. *Leprosy Rev.* **13** (1942) 31-46.
6. DAVEY, T. F., ROSS, C. M. and NICHOLSON, B. Leprosy: A changing situation in Eastern Nigeria. *British Med. J.* **2** (1956) 65-68.
7. GUINTO, R. S., RODRIGUEZ, J. N., DOULL, J. A. and DE GUIA, L. The trend of leprosy in Cordova and Talisay, Cebu Province, Philippines. *Internat. J. Leprosy* **22** (1954) 409-430.

8. [LEAGUE OF NATIONS] The Principles of the Prophylaxis of Leprosy. First General Report of the Leprosy Commission, Health Organization, League of Nations. Geneva, 1931.
9. [LEONARD WOOD MEMORIAL] Report of the Leonard Wood Memorial Conference on Leprosy, Manila, 1931. Philippine J. Sci. **44** (1931) 449-480; *reprinted in* Internat. J. Leprosy **2** (1934) 327-356.
10. RISI, J. B., FONTE, J. and ROSSAS, T. P. Readjustamento do trabalho antileprotico ás determinantes atuais. Rev. brasileira Leprol. **20** (1952) 156-177; *also* Brasil-Méd. **67** (1953) 373-391.
11. ROGERS, L. and MUIR, E. Leprosy. Bristol: . Wright & Sons Ltd., 1925.