LEPROSY IN UGANDA
A SURVEY IN THE BUSOGA DISTRICT OF THE EASTERN PROVINCE [1]

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INTRODUCTION

Previously reported work in Uganda Protectorate included a leprosy survey by samples of the population in a wide range of places (1). The total number of persons examined then was 14,808, and the leprosy prevalence indicated was 54 per thousand; but since the population of Uganda is over 4,000,000 it was emphasized at the time that that survey needed amplifying and extending. In pursuance of that objective a more intensive survey in the Busoga District of Uganda was conducted in November and December of 1949, and the results and inferences are recorded in this paper. The findings are correlated with previous results, both in Uganda and in the other countries of East Africa: Kenya (2) and Tanganyika (3, 4, 5). The earlier work in this region has recently been summarized (6).

The people concerned in this survey comprise a homogeneous and distinct tribe, the Busoga, of Bantu origin, who inhabit an area near the source of the Nile (Lake Victoria) and its first beginnings (the Victoria Nile). It is believed that this is the first time a leprosy survey has been conducted amongst them.

The Busoga District, part of the Eastern Province of Uganda, lies between the equator and 1° 30′ north latitude and is just about bisected by longitude 33° 30′, as shown in Text-fig. 1. The land area is 3,771 square miles, and the altitude above sea level varies betwen 3,400 and 4,000 feet. The average atmospheric humidity is 60 per cent, the average atmospheric temperature 71.4°F., and the mean annual rainfall 43.39 inches. The country is lush and green, either gently undulating or level and marshy, and there is a rich abundance of insect life. The total population reaches 513,805, and the density of population is 136 per square mile.

The main products of the area are cotton, beans, groundnuts, sugar and timber. Agriculture is the predominating industry,

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but there are also sugar production, cotton ginning, saw milling and fisheries. The chief—and, indeed, only—town is Jinja, which has a population of 14,000, of whom the non-natives number 4,000.

Near Jinja there is being developed a great hydroelectric scheme intended to harness the output of Lake Victoria at the Owen Falls. An increase in industrialization consequent on this scheme may affect the life of the whole district, in which as will be seen leprosy is widespread and the incidence is rather high.

RESULTS OF THE SURVEY

In twenty-one places (see Text-fig. 1) a total of 35,118 persons were examined for leprosy, by samples of 1,000 or more in each place except one.[2] Satisfactory representations of each sex and of all age groups were obtained. As shown in Table 1, a total of 1,177 cases was found, which gives a prevalence rate of 33.5 per thousand. From these results it is estimated that the total number of cases in the Busoga District is around 15,000.

ANALYSIS OF THE CASES FOUND

Tribal origins.—Of the 1,177 persons found to have leprosy, all but 9 were of the Busoga tribe. The strangers were 3 of the Teso tribe, 1 of the Manyiri tribe, 1 of the Mugwere tribe, and 1 of the Baganda tribe, all from adjoining parts; also 2 of the Jaluo tribe, from Kenya, the part on the eastern side of Lake Victoria, and 1 of the Wasukuma tribe of Tanganyika, the part at the southern end of Lake Victoria. The existence of these few strangers among the Busoga illustrates the well-known fact that persons with leprosy do tend to wander, and to be found far from their country and place of origin.

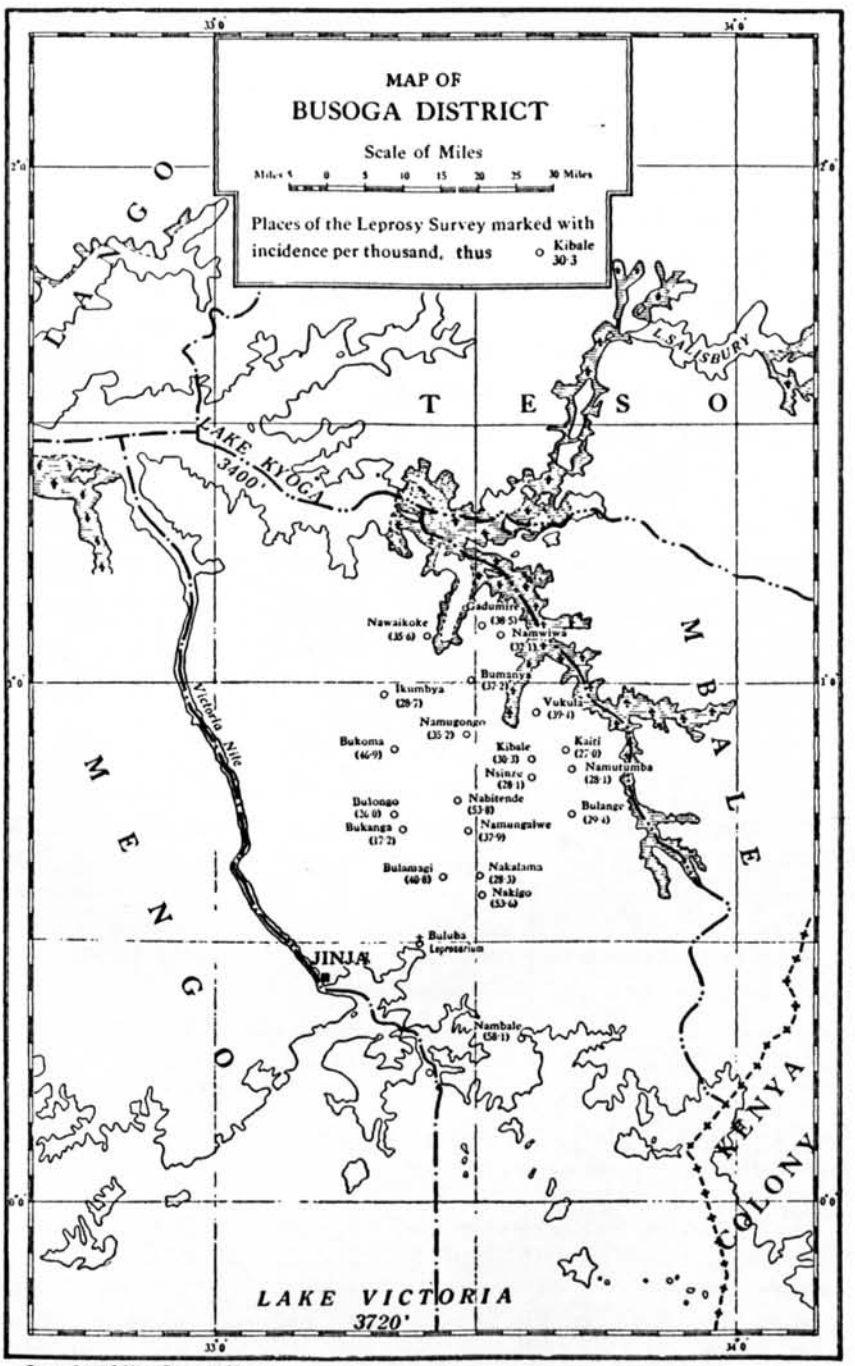
Sex incidence.—The 1,177 cases found comprised 740 males and 437 females. The male-female ratio, therefore, is 1.7:1.

Age incidence.—Of these cases, 223 (19%) were children aged 14 years or under, and 954 (81%) were above that age. The distribution is as follows:

Age	5	6	7	8	9	10	11	12	13	14	15	16
Number	11	20	20	16	16	21	18	35	22	37	18	28

Age	17	18	19	20	25	30	35	40	45	50	55	60
Number	18	15	26	96	120	152	148	104	88	59	32	20

[2] This work was done with the assistance of the medical team, Messrs. Nekemia, Byansi, and Musenero.



Survey Land & Mines Dept., 1950.

TEXT-FIG. 1. Map of the Busoga District of Uganda, showing the localities surveyed and the rates found in them.

TABLE 1.—*Details of the Busoga survey*

Serial No.	Date (1949)	Place	Existing population *a*	No. of persons examined	No. of cases found	Prevalence per thousand
1	Nov. 28	Nakalama	7,953	1,023	29	28.3
2	Nov. 29	Nakigo	8,023	1,006	54	53.6
3	Nov. 30	Bulamagi	10,600	1,200	49	40.8
4	Dec. 1	Nabitende	8,144	1,058	57	53.8
5	Dec. 2	Nambale	8,268	1,204	70	58.1
6	Dec. 6	Bukanga	16,175	1,685	29	17.2
7	Dec. 7	Bulongo	12,556	2,231	58	26.0
8	Dec. 8	Bukoma	7,366	533	25	46.9
9	Dec. 9	Ikumbya	8,736	2,855	82	28.7
10	Dec. 10	Namungalwe	8,596	1,106	42	37.9
11	Dec. 12	Namugongo	11,503	1,442	50	35.2
12	Dec. 13	Bumanya	9,625	1,342	50	37.2
13	Dec. 14	Nawaikoke	12,067	2,414	86	35.6
14	Dec. 15	Gadumire	8,578	1,660	64	38.5
15	Dec. 16	Namwiwa	7,017	1,900	61	32.1
16	Dec. 17	Vukula	12,688	1,419	56	39.4
17	Dec. 19	Kibale	9,890	1,812	55	30.3
18	Dec. 20	Nsinze	10,355	2,200	62	28.1
19	Dec. 21	Namutumba	13,307	3,022	85	28.1
20	Dec. 22	Kaiti	9,766	2,000	54	27.0
21	Dec. 23	Bulange	7,790	2,006	59	29.4
		Totals	208,583	35,118	1,177	33.5

a Figures by courtesy of the District Commissioner. Total population, Busoga District, approximately 500,000.

The majority of the children presented lesions of the elevated major and minor tuberculoid kinds, but lepromatous, intermediate, and polyneuritic cases were not lacking. Most of the children had acquired the infection in the family circle.

Type of leprosy.—Lepromatous cases, which are the infectious ones, numbered 263, or 22.3 per cent of the whole. The usual proportion of such cases found in my previous surveys in

East Africa is 20 per cent or somewhat less, so the Busoga rate is rather higher than usual.

Cases with elevated major and minor tuberculoid lesions of moderate degree numbered 612, or 52 per cent of the whole. Such cases represent the less grim side of the leprosy picture, indicating minimal infectivity, high natural resistance of the subject, and relatively ready curability.

All other forms of leprosy were well represented, such as the intermediate and polyneuritic ones, and cases "arrested with deformity" (these numbering 79, or 5%). The "pale flat macule" form described as common in Nigeria is not a feature of East African leprosy.

The general picture is clear cut, with at one end of the scale the nodular, macular, and diffuse lepromatous cases, and at the other a profusion of elevated tuberculoids, with a smattering of intermediate, secondary polyneuritic, and rare primary polyneuritic cases. The commonest site of origin of the disease—apart from the lepromatous type, which is likely to be a generalized state—seems to be a choice between the forehead, other facial parts, the scapular area, the lumbar region and buttocks, the thighs, especially the outer aspects, and the neighborhood of joints.

On previous surveys in East Africa what may be called "old folks' leprosy" has often been noticed, and attention was particularly drawn to it in Busoga because of the apparent healthiness of the subjects. By this term is meant not gross debilitating or deforming leprosy, but a moderate grade of affection in apparently wiry and vigorous aged people who, from all accounts, did not have the disease in earlier life but developed it in later years. The lesions are usually a few quite conspicuous elevated major or minor tuberculoids, and not much else. There were 16 cases of this type (1.3%); the ages of the patients were 50 years and upward; and they were of both sexes. These cases can only be interpreted as resulting from the wearing or breaking down of the subjects' life-long high resistance, perhaps by deterioration in living circumstances or the effects of age itself. Further, there seems little time left in the life of these individuals for the disease to develop into something serious and crippling. The existence of such cases indicates that there is a fairly high prevalence of leprosy infection in the community.

OTHER EPIDEMIOLOGICAL FACTORS

Living conditions and contacts.—All of the patients were living in houses of grossly inadequate capacity as regards cubic

space per occupant, with which are allied inadequate light and ventilation. There is great need for some inspired architect to devise a house, inexpensive and acceptable to native opinion, which would be for the first time a hygienic one. Adequate light and air in living quarters would surely strike at the transmission of leprosy where it would do most good.

Not a few of the patients—as many as 268, or 22.7 per cent—were living alone. The idea of home or village segregation is known, but as yet it is practiced to an extent far too limited, and it is too often confined to persons deserted by relatives.

A majority of the patients—722 of them, or 61 per cent—were living in house contact with children. These people had a total of 1,968 children between them, an average of 2.6 per case. This small army of contact children constitutes another example of conditions invariably found in East Africa. There is an almost total lack of understanding of the great danger to children in such circumstances, and of the fact that it is precisely thus that leprosy is kept going indefinitely in the community.

Family leprosy seemed to be a strong feature of the situation in Busoga. There were 22 instances of groupings in family leprosy. Some examples are:

Mother, aged 25, type Te2, and daughter aged 6, type Te1; the woman living with husband and 2 children.

Father, aged 45, Te3, and son, aged 14, Te2; the man living with 7 children; wife gone.

Husband, aged 45, Te2p1, and wife, aged 40, Te2p1.

Mother, aged 40, N1p3, and daughter, aged 11 Lmp2; the woman living with husband 3 children.

Father, aged 30, N13, and son, aged 8 Lm2; the man living with wife and the 1 child.

Mother, aged 40, Te3, and daughter, aged 9, Te1; the woman living with husband and 3 children.

Father, aged 45, Te3p2, and son aged 14, Te2; the man living with wife and the 1 child.

Living with multiple wives is of some importance in this connection, because it tends to increase the number of children in home contact with a given case. There were 24 men so living, with a total of 55 wives and 97 children, as shown in the following condensed list.

1 man with 4 wives, and 9 children;
5 men with 3 wives each, and 27 children;
18 men with 2 wives each, and 61 children.

The average of 4 children per man is to be compared with the average of 2.6 per cent for all who lived with children. However,

the infertility which is seen in leprosy, at least in advanced lepromatous cases, was evident in some of these plural-wife families: 1 man with 3 wives had no children, and 5 men with 2 wives each had in total only 5 children.

The factor of domicilary and communal overcrowding, perhaps the most important factor in causing a high leprosy incidence—apart from failure to segregate cases and to prevent house contact of children—is prevalent in Busoga. Unhygienic customs, such as passing the pipe and the beer from mouth to mouth, were reported to be still prevalent, not only amongst persons with cases of leprosy but also in company in which they and the general public took part.

Diet.—The diet of the people of this region is unbalanced, lacking first-class biological proteins and certain vitamins and salts, but there seemed to be no evidence of any specific connection between diet and leprosy. Nevertheless, the general protective action of an adequate, balanced diet would doubtless serve to help to protect against leprosy as against other diseases. The Busoga, like the other tribes, tend to put too much of their grains into the making of beer, and to be involved in food shortage later. So far in this work, it has not been possible to attempt a correlation between the prevalence of leprosy and the staple diets of the various tribes, such as bananas, millet, legumes and fish.

Climatic conditions.—High average atmospheric humidity is the climatic lot of all who live in Busoga, that country being bordered by great lakes and the Nile and being rich in swamps. The district provides another example of my invariable finding in East Africa, that high humidity is associated with the higher leprosy incidence rates. This influence of humidity, I am convinced, extends also to progress under treatment, and I therefore prefer that leprosaria be located in dry areas—if the country concerned can offer any.

The surveys made have now ringed Lake Victoria, and the prevalence rates found are 33 per thousand north and west of the lake, 31 to the east, and only 15 to the south. The explanation of the difference lies partly in less domiciliary and community crowding, but also in part to the fact that that region, at the wrong end of the lake, is one of less atmospheric humidity.

Evidence of indigenous treatment.—Evidence of such treatment was found in many of the cases, ranging from the scratches of scarification to a cosmetic covering which may be also counter-irritant in action. The effects of this treatment were often extremely good from a cosmetic point of view, making the lesions

hard to detect, but it was disappointing to find that the disease as a whole seemed uninfluenced in its course. Certainly the effect on lepromatous leprosy seemed nil. In one case it was noticed that the lepromatous nodules had been punctured and scarified—obviously resulting in the broadcast of the mycobacteria, for no dressing was worn.

It was pleasant to find a few persons who had been under treatment in the leprosarium at Buluba, and who had been free of the disease for long periods of time. The great majority of cases of active leprosy seen, some 95 per cent, had received no treatment at all, either indigenous or from Buluba.

BACKGROUND OF OTHER DISEASES

While making rapid examinations for a particular condition of so many people as have been involved in these surveys, attention was naturally focused mainly on that condition, but other diseases were noted as they drew the attention. The following list must therefore be partial, and without numerical values for incidence but it seems worth recording because of the picture it gives of the background of other diseases. These are: scabies, mostly chronic; tineas of many kinds; pityriasis; pellagra-like skin conditions; leucoderma; framboesia, fresh, late, and with contractures; malaria; syphilis; tuberculous spinal kyphosis; gross anemias, secondary or tropical; uncinariasis; filarial elephantiasis; onchocerciasis; lymphostatic verrucosis of the feet; goitres and cystic thyroids; and eye diseases, notably trachoma, corneal ulcer, gonorrhoeal ophthalmia, iritis, keratitis and cataract.

Of these conditions, one which I regard as of peculiar relevance to leprosy is scabies. In my wide-spread surveys in East Africa I have come to accept the amount of scabies as a rough indicator of the incidence of leprosy. Where there is much gross, untreated scabies, there is liable also to be much leprosy in the community, and instances are numerous of the two diseases being coincident in the same person.

This correlation between scabies and leprosy may of course apply only to East Africa, but it has been quite striking and almost constant. Chronic scabies is indicative of a general low standard of living and a certain lack of cleanliness of body and clothes. However, the explanation of the correlation may be that chronic scabies means chronic scratching and, altogether, many minute abrasions through which the causal germs of leprosy are inoculated, repeatedly and frequently. Above all,

scabies in these tribes is most prevalent in childhood, a time when the susceptibility to leprosy infection is greatest. On the whole, it is not improbable that a fair proportion of persons with leprosy in this country acquire their disease partly or entirely by the beggarly road of scabies.

DISCUSSION

From the results of this survey it would appear that this one district of Uganda is faced with the problem of dealing with an estimated 15,000 cases of untreated leprosy, out of the appalling estimated total, of 100,000 for the 5,000,000 population of the entire country, which would be 30 per thousand. This is a much higher average prevalence than has been found in the other countries of East Africa (see Table 2), for the estimated 80,000 in Tanganyika are among 6,000,000 people.

TABLE 2.—*Summary of leprosy survey work in East Africa, 1947 to 1949.*

Area and dates *a*	No. of persons examined	No. of cases found	Prevalence per thousand	Estimated total cases
Uganda				
Wide-range sampling 1947-1948 (1)	14,808	800	54.0	
Busoga District 1949 *b*	35,118	1,177	33.5	(15,000)
Total	49,926	1,977	39.5	100,000
Kenya 1948 (2)	53,814	552	10.2	35,000
Tanganyika 1947-1949 (3-5)	114,025	1,631	14.3	80,000
East Africa Totals	217,765	4,160	18.1	215,000

a Figures in parentheses are references to published reports.
b Present report.

Fortunately for this particular district of Uganda, Busoga has a leprosarium, the St. Francis Settlement at Buluba, located on the north shore of Lake Victoria some 30 miles from Jinja. Its present capacity of 300 patients must obviously be raised to, say, 1,000 patients, and its influence should be brought to bear on its hinterland by means of survey trips, treatment centers, and the training of leprosy personnel for use amongst the people. Subsidy for building expansion is therefore its most urgent need. It already has a medical officer, trained Sisters, and a lay

worker, and a sulfone drug is being used. But even with Buluba enlarged to the suggested capacity, it would still be necessary, in addition, to establish another full-sized leprosarium in the heart of Busoga, in order to begin to deal adequately with the leprosy problem of the district, and to begin to control the disease.

Control of leprosy in Busoga would be greatly forwarded by the spread of the practice of village or home segregation of known cases, with the separation of children from all such. From the leprosaria should come the repeated surveys to ensure that all cases are found, and example and precept about the other ways to be followed, as well as curative treatment. The administration of the district can in the meantime help greatly by the publication in councils of the principles of home and village segregation, and child separation. It should never be forgotten that leprosy is a preventable disease.

SUMMARY

Results of a leprosy survey made in the Busoga District of Uganda in November and December 1949 are reported. From the finding of 1,177 cases among the 35,118 people examined, which gives a prevalence of 33.5 per thousand, it is estimated that there are 15,000 cases in this one district of Uganda.

Analysis is made of the cases of leprosy found in the survey, and various points of interest are mentioned. These include the low proportion of lepromatous cases and high proportion of tuberculoid cases, which is characteristic of East African regions generally; the frequency of recently developed leprosy in elderly people ("old folks' leprosy") ; the various epidemiological factors which prevail, including especially the overcrowding in houses and communities, the high frequency of home contact with children, and the living with multiple wives; the apparent influence of high humidity, as exemplified by differences seen around Lake Victoria; and an apparent connection between scabies and leprosy.

An indication of the general background of other diseases is given, and the leprosy problem of the Busoga district is discussed.

From July 1947 to the end of 1949, a total of 217,765 of the native population of East Africa has been examined by samples. The heaviest prevalence of leprosy has been found in Uganda and more moderate rates in Kenya and Tanganyika. On this basis the number of existing cases in East Africa has been estimated as on the order of 215,000.

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