

# THE OCCURRENCE OF TRACHOMA IN THE EASTERN CAPRIVI STRIP OF SOUTH WEST AFRICA

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The Caprivi Strip is a tongue of land about 250 miles long joining the territory of South West Africa to the territories of Northern and Southern Rhodesia, the junction occurring on the Zambesi River west of the Victoria Falls. It is bounded on the West between latitudes  $18^{\circ}\text{S}$  and  $18\cdot3^{\circ}\text{S}$  by the Okavango River, a relatively large river flowing from Angola into the Okavango swamps in Ngamiland. It is bounded on the North by a straight line joining Libebe on

the Okavango at latitude 18°S, to Katimo Molilo on the Zambesi at latitude 17·5°S. Across this border is Angola in the West and Barotseland Province of Northern Rhodesia in the East.

On the East it is bounded by the Zambesi River between Katimo Molilo in latitude 17·5°S and Kasungula in latitude 17·75°S. The 3 territories of Northern and Southern Rhodesia and Bechuanaland meet at its S.E. tip. Most of the southern border in its Eastern half is formed by the Linyanti River. The Strip is about 20 miles wide in its western half, but increases in its middle zone to a width of about 60 miles to embrace the Linyanti swamps and then narrows again to the East.

The Guando River flows from Angola across the middle of the Strip to diffuse into the Chobe or Linyanti swamps which cover much of the Eastern half of the Strip and drain into the Linyanti River. This river sometimes flows from West to East and sometimes from East to West. The direction of flow depends on the relative state of flood of the Zambesi and Cuando rivers. Its reversibility is a clear indication of the general flatness of this region. The country surrounding the swamps and rivers is also flat and sandy, and is covered with subtropical woodland bush and deciduous forest, and in the non-forested areas with grass. There is a distinct rainy season from October to March, when heavy falls of rain occur and when the grass and vegetation grow luxuriantly. This is followed by the dry season from April to September, when the vegetation withers and the deciduous trees cast their leaves and the whole area presents an arid appearance. Game, both large and small, abounds and the area supports a relatively large human population living in villages scattered along the river and the edges of the swamps. Their habitations are mud huts covered with grass or reed thatch roofs. Their staple diet is maize meal, supplemented occasionally by meat. There is no provision for the disposal of sewage and there is heavy contamination of the soil with faeces in the neighbourhood of the villages. Flies including various faecal feeding species are very prevalent. *Musca sorbens* and other species of *Musca* can often be seen feeding relatively undisturbed on the eye secretions of infants, and if they are concerned in the spread of eye disease they would often have an opportunity of transmitting infection.

During April and May 1959 a general health survey of the total population of about 18,000 of the Eastern Caprivi Strip was carried out. In this survey 3,130 individuals of both sexes and including all age groups were examined clinically. This sample included inhabitants from 40 different villages, in which lived 80% of the total population and which were scattered over 80% of the area of this region.

The eyes, including the tarsal conjunctiva exposed by everting the lids, were closely inspected for clinical signs of trachoma. These were detected in most individuals. The findings are summarized in Tables I and II.

TABLE I. INCIDENCE OF CLINICAL TRACHOMA

Age group	Sex	No. examined	Trachoma No.	%
0 - 23 months	M & F	105	77	73·33
2 - 14 years	M & F	1,457	1,005	68·98
15 - 60 years	F	880	556	63·18
15 - 60 years	M	688	358	53·03
All ages	M & F	3,130	1,996	63·77

TABLE II. CLINICAL FINDINGS

Age group	Sex	No. examined	Blindness one or both eyes	Entropion trichiasis
0 - 23 months	M & F	105	1	—
2 - 14 years	M & F	1,457	1	—
15 - 60 years	F	880	18	38
15 - 60 years	M	688	16	18
All ages	M & F	3,130	36	56

In affected infants the conjunctiva had a velvety granular appearance; very few showed marked papillary hypertrophy and larger follicles.

In children many showed pannus. About half were in MacCallan's stage 1, and half in stage 2. Stage 3, the stage of cicatricial replacement, was only rarely seen.

In adults pannus and the cicatrizing stage 3 were seen frequently. Trichiasis and corneal scarring were rare and were only observed in the aged.

In spite of the high incidence of trachoma in the younger age groups it appears that the disease usually runs a mild course only rarely leading to entropion, trichiasis, corneal scarring and blindness.

The area was revisited in July and November 1959. More than 2,000 individuals were examined again on each occasion. The findings in regard to the incidence, age distribution and late crippling manifestations of trachoma were similar to those of the initial survey.

In November 1959 conjunctival smears were taken at Katimo Molilo from 60 patients of both sexes and all ages; they exhibited clinical signs of trachoma at various stages. Smears were taken by scraping the everted upper lid with a scalpel blade and smearing the material on a clean glass slide. The incidence of trachoma at Katimo Molilo was found to be 26·66% during the initial survey. These smears were sent to the South African Institute for Medical Research.

## LABORATORY FINDINGS

The smears were fixed by immersion in absolute methyl alcohol for 5 minutes and placed in 1 : 20 solution of Giemsa stain overnight. They were then washed and differentiated in distilled water, allowed to drain and dry, standing on edge. They were examined under a 1/12 oil immersion, note being taken of the cell pattern and the presence of bacteria and of particles resembling virus elementary bodies and virus inclusion bodies. The results are summarized in Table III.

TABLE III. RESULTS OF EXAMINATION OF CONJUNCTIVAL SMEARS

	No.	%
Smears examined	Total 60	100
Trachoma inclusions	3	5
Granules resembling elementary bodies	3	5
Bacteria resembling Koch Weeks	2	3·3
Bacteria resembling diphtheria bacilli	57	95
Bacteria resembling pneumococci	1	1·7

Findings of interest were the detection of inclusion bodies and elementary bodies resembling those characteristic of trachoma in 3 of the 60 smears, and of bodies suspiciously like the elementary bodies of trachoma in 3 other smears. Assuming that these latter were in fact diagnostic of trachoma, the findings indicate that at least 10% of the population were suffering from active trachoma at the time of collection. The true incidence of this infection is therefore considerably greater.

Bacteria were detected in nearly all the slides examined, but in most these were scanty and resembled the diphtheroid bacillus, *C. xerosis*, a normal inhabitant of the conjunctival sac.

Of considerable interest is the relatively low incidence of infections with bacteria resembling Koch Weeks bacilli. The incidence of these infections in smears taken from cases clinically resembling trachoma in the North Eastern Transvaal was high and contrasts with the present findings. This relatively low incidence of pathogenic bacterial infection may account for the relatively few late sequelae of trachoma noted in the clinical examination of this population.

#### SUMMARY

Clinical examination of a representative sample of the population of the Eastern Caprivi Strip showed that 64% had evidence of eye infections resembling trachoma. The highest incidence was in infants up to 2 years old; the 2 - 14

year age group had an incidence of 69%, the females of the age group 15 - 60 years an incidence of 63%, and the male group of 15 - 60 years an incidence of 53%. Few cases showing entropion, cicatrization or other late sequelae were found.

Microscopic examination of 60 conjunctival smears taken from the inhabitants of one area showed the presence of typical inclusion bodies in 3 cases, and of particles resembling the elementary bodies of trachoma in another 3, giving an incidence of 10% of active infections. The true incidence of the disease is therefore considerably greater. Of interest also was the relatively small proportion which showed bacteria resembling Koch Weeks bacilli. The low incidence of pathogenic bacterial infections may account to some extent for the small number of cases showing entropion, cicatrization, and other late sequelae of trachoma.

This study has confirmed that trachoma occurs and is prevalent in the population of the Eastern Caprivi Strip.