

**Zeitschrift:** Acta Tropica  
**Herausgeber:** Schweizerisches Tropeninstitut (Basel)  
**Band:** 33 (1976)  
**Heft:** 3

**Artikel:** Incidence of and beliefs about trypanosomiasis in the Senegal River Basin  
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**DOI:** <https://doi.org/10.5169/seals-312231>

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# Incidence of and Beliefs about Trypanosomiasis in the Senegal River Basin

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## *Abstract*

A survey was conducted for trypanosomiasis of 10,875 persons living in 56 villages in the Senegal River Basin in Mali. The incidence of the disease was found to be 137.9/100,000. An interview survey was simultaneously undertaken in order to elucidate local beliefs about the disease. Although trypanosomiasis is recognized as a distinct disease entity once the late stage has developed, there is no knowledge of its relationship to tsetse flies. It is common knowledge that hunters who frequent riverine forest galleries and forested savanna often contract the disease. Their frequent and intense exposure to *Glossina* sp. is not viewed as having any relationship to their contracting the disease.

## **Introduction**

Trypanosomiasis was for many years a major disease problem of high incidence throughout the West African savanna (RICHEL, 1974). The incidence of the disease began to fall progressively in most areas of this zone during the 1940's and 1950's under the impact of trypanosomiasis control programs. In the Republic of Mali (formerly French Sudan), as in the other francophone countries of West Africa this control effort was and is still being carried out by the Endemic Disease Service, known as the Service National des Grandes Endemies.

The first attempts at delineating the epidemiology of trypanosomiasis in Mali were made in 1908 by BOUFFARD. He established that the disease was endemic in the southern part of the country in the Region of Sikasso. In 1912 a second focus of the disease was found further to the north at Koulikoro on the Niger River (LÉGER, 1912). However, it was not until the 1930's with the development of the Endemic Disease Service that the epidemiology and incidence of the disease were fully known (SICÉ & TORRESI, 1939). By using mobile teams of paramedical workers, the Endemic Disease Service was able to regularly examine large numbers of people living in endemic areas and to treat those infected with the disease (Table I). The use of these mobile teams also enabled the physicians of the Endemic Disease Service to accurately chart the geographic distribution of the disease. The major foci of the disease were in the southern part of the country in Sikasso, Koutiala, Segou and San and in the central part of the country around the capital of Bamako (SICÉ & TORRESI, 1939). All of these foci lie around the Niger River and its affluents. By the early 1960's, the disease had been brought under good control in all of these foci. In 1971, a large number of cases were uncovered for the first time in many years in the area of Ouelessebouyou, the northern part of the Sikasso focus (SOW, 1974).

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*Table I. Trypanosomiasis in the Republic of Mali, 1960–1971*

Year	Population examined	Number of new cases diagnosed	Incidence per 100,000 population
1960	653,257	1,205	184.5
1961	869,653	1,188	136.6
1962	734,617	892	121.4
1963	857,538	796	98.8
1964	901,949	538	59.6
1965	324,813	432	133.0
1966	519,195	49	94.4
1967	739,173	36	48.7
1968	313,689	70	22.3
1969	400,814	62	15.4
1970	423,040	109	25.7
1971	524,418	71	13.5

The western most part of Mali, the Region of Kayes, has not been as carefully studied for trypanosomiasis as have the major foci of the country. This is a region with a low population density of 6.6/km<sup>2</sup> compared to that of 9.6/km<sup>2</sup> for Sikasso. It is also a region which has been economically rather peripheral to the modern cash economy of Mali. Even subsistence farming has been difficult in this region and as a consequence there has been a large exodus of people, especially young males. They move into the cash economies of the West African coast, Bamako and Paris. Thus the stated population of 724,536 for this region for 1971 may be far lower than the actual population (KEITA, 1971).

The Senegal River rises in this region from two major affluents, the Bakoy and the Bafing which join at Bafoulabe. A large part of the Senegal River Basin, almost half of its geographic area, lies in this region. At the present time there are long-range plans for the economic development of the Senegal River Basin in the three country area of Mali, Mauritania and Senegal. Considerable thought has been given to existing disease problems in this basin and how their epidemiology might be affected by the construction of dams, irrigation systems and artificial lakes and also to the subsequent changes in population dynamics which new industries and agricultural projects might stimulate. With a view towards intelligent economic planning it is important to gather some basic data about the incidence of certain important diseases in the region. Also, it is necessary to find out what indigenous populations already know and do about these major diseases with a view towards future health education programs. The present study was undertaken in order to gather some basic incidence data on trypanosomiasis in the Senegal River Basin, and information about local beliefs and practices associated with the disease.

## Methods

During the calendar year, 1971, mobile teams of the Endemic Disease Service worked in five of the country's six administrative regions, examining the population for onchocerciasis, trypanosomiasis and leprosy. A total of 524,418 persons

were examined over a period of eight months. Three mobile teams of nurses conducted the survey in the Region of Kayes, where the Senegal River Basin is situated. A total of 10,875 persons were examined in 56 villages in two administrative areas, the cercles of Bafoulabe and Kita. An interview survey was conducted simultaneously by the three teams of nurses and by the authors using a questionnaire. This questionnaire contained 20 questions covering various aspects of the disease and were asked of village elders. The population of the study area is Malinke for the most part and to a lesser extent Bambara. These two ethnic groups speak mutually understandable languages and share common cultural and social characteristics.

## Results

### *Incidence*

Of the 10,875 persons examined, 15 were found to have trypanosomiasis. This represents an incidence rate of 137.9 per 100,000 population. Throughout Mali, a total of 71 cases were found among the 524,418 persons examined. The incidence rate for the country as a whole was 13.5 per 100,000.

### *Names for Trypanosomiasis*

The commonest name for the disease is *souna bana* ("sleep illness") and is specific. Another name is *souma*, which literally translated means "cold". It is employed for any disease thought to be due to cold air or water and is not specific for trypanosomiasis. In certain villages the name *soun-nogo bana* is used which means "sleep illness". The words *soun-nogo* and *souna* are synonymous. In a small number of villages, the term *mara* is employed. This is a general term whose literal meaning is "to possess". It is used by the Malinke and Bambara for many chronic diseases such as onchocerciasis, leprosy, tertiary syphilis and osteoarthritis.

### *Causes of the Disease*

The Bambara and Malinke believe that all diseases are due to a disequilibrium in one of four elements of which all beings are composed, air, water, earth and fire (ZAHAN, 1957). A disequilibrium, however, may be caused by a variety of supernatural forces such as ancestor spirits, sorcery and witchcraft. Trypanosomiasis is classified as a "water illness", that is, it is thought to be due to a disequilibrium in this element. Less frequently, especially among the Bambara, it is said to be an "air illness". There is, however, much variability in the supernatural cause. In a given village, the disease in one person may be attributed to sorcery and in another to angered ancestor spirits. The

social context in which the disease occurs is an influential factor in causation determination. When large numbers of cases occur in a given area, either witchcraft or sorcery are frequently suspected. Appropriate spiritual counter measures are implemented and occasionally a village might be moved to a new location if these fail.

### *Susceptible Groups*

It is common knowledge that hunters contract the disease more frequently than others. These men frequent riverine forest galleries where *Glossina palpalis* abound and uninhabited forests where *Glossina morsitans* are present. They therefore have more intense and frequent contact with tsetse flies. This, however, was not given by informants as the reason for the higher incidence of the disease in hunters.

Hunters are often blacksmiths (*numu*), a caste of artisans who also serve as herbalists (*furatigui*) and diviner-healers (*basitigui*) in Bambara and Malinke society. They can play both a benevolent and malevolent role and for the latter reason are frequently feared. They occupy key positions in the hierarchies of secret initiation societies such as the *komo* and *nama* and are themselves organized into special societies. As a group they are seen as dealing constantly with the supernatural. Hunter-blacksmiths who contract trypanosomiasis are viewed as the victims of some malevolent supernatural power such as sorcery, launched against them in either a retaliatory or pre-emptive manner.

### *Knowledge of the Vector*

Very few individuals are aware that trypanosomiasis is a vector transmitted disease and, those who are, have obtained this information from medical workers. Tsetse flies are recognized by most as being distinct from other flies and their habitats well known. It is common knowledge that they are especially encountered in riverine forest galleries, around marshes and seasonal ponds and in forests where wild-life is present. Most are also aware that tsetse are especially active in the early morning and late afternoon hours when ambient temperatures are relatively cooler than at mid-day. They are also aware that tsetse can be active on moonlight nights.

Tsetse flies are called *kinifino* whereas *Musca domestica*, the common house fly is called *dele*. While tsetse are viewed as annoying and their bites painful, no measures are taken to avoid them. Hunters are in contrast to others well dressed when they go hunting, wearing long sleeved tunics, hats and trousers. Thus little of their skin is exposed. Their dress is traditional, consisting of locally woven cotton cloth dyed

with certain plants to give it a brown-maroon color or a pattern with black and white designs painted with mud. This dress is rather uncomfortable in the hot ambient temperatures of Mali which raises interesting questions about its origins and development. It is possible that this mode of dress evolved as a protection against tsetse fly bites, but there is no hard evidence to sustain this theoretical possibility.

## **Discussion**

Trypanosomiasis was once a serious disease problem in Mali. From 1939, when systematic surveys for the disease were begun until 1971, a total of 32,167 cases were diagnosed (KEITA, 1971). In 1939, the incidence of the disease was 1,535.6/100,000. By 1960 this had fallen to 184.5/100,000 and by 1971 to 13.5/100,000. This dramatic decline has been achieved through a multifaceted program consisting of the diagnosis and treatment of cases, chemoprophylaxis of especially susceptible population groups and vector control.

The disease has never been considered a major problem in western Mali in the area of the Senegal River Basin. Since 1939 the attention of the Endemic Disease Service has been focused on the high population density areas of the country, especially the Regions of Bamako, Sikasso and Segou. As a consequence, less effort was made to systematically survey the Senegal River Basin area where population densities are low. As the present survey has shown, trypanosomiasis is a problem in this area. The incidence of the disease was found to be 137.9/100,000 population, ten times the incidence for the country as a whole.

At present, there are extensive plans for large scale agricultural development schemes in the Senegal River Basin. These are being coordinated by the Organisation pour la Mise en Valeur du Fleuve Sénégal (OMVS), which consists of Mali, Senegal and Mauritania (BRASSEUR, 1974). Dams are being planned along with irrigation projects and the re-settling of large numbers of people. Trypanosomiasis is a problem in this area and will no doubt be affected by these development schemes. It must be carefully taken into account along with other diseases in the planning phases of these projects.

While rural populations recognize trypanosomiasis as a distinct disease process, they possess no knowledge of its epidemiology. Similarly, the vectors are recognized, but their role in the transmission of the disease is not known. An integral part of any development scheme should be to familiarize people with the epidemiology of the disease, to make them aware of the role of the vector and to institute meaningful programmes to treat and prevent the disease.



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