

## Sleeping sickness situation in Tanzania

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**Abstract:** During the last two decades, the East African region experienced emergency and marked resurgence of communicable diseases such as HIV/AIDS, Ebola, haemorrhagic fever, malaria, trypanosomiasis and other epidemic-prone diseases. These communicable diseases have had a profound effect on human populations, affecting international travels and trade. African Human Trypanosomiasis has re-emerged as one of the major public health problem in Tanzania being reported in about 43% of all regions in the country. The situation of sleeping sickness in the country is a disappointing setback in the sphere of disease control in the country.

Of recent, only a few trypanocidal drugs have come into the market, and most of these are toxic. Understanding the burden of the disease is critical to reducing their morbidity and mortality, developing effective prevention and treatment strategies, establishing public health policy related to the threats it represent, and making decisions on where, when and how to use limited resources in the fight against the disease. In this paper we analyse the current situation of human sleeping sickness in Tanzania and discuss constraints in its control.

### Introduction

Human African Trypanosomiasis or sleeping sickness is one of the major public health problems and constraints to sustainable development in some areas of Tanzania. The disease was first recorded in 1922 in Maswa district, south of Lake Victoria (1). It then spread throughout mainland Tanzania, and is presently endemic in 9 regions, namely Arusha, Manyara, Mara, Lindi, Ruvuma, Kagera, Tabora, Mbeya and Rukwa. The annual average for the past decade was 264 cases (Table 1).

Although during the past ten years 9 regions were accounted for presence of sleeping sickness, the disease tends to be more concentrated in Kasulu and Kibondo district in Kigoma region. Currently, there is also an increasing number of sleeping sickness in Urambo district in Tabora.

Human African Trypanosomiasis (HAT) is caused by *Trypanosoma brucei rhodensiense* and *T. b. gambiense*, transmitted by tsetse fly (*Glossina*). There are two forms of the disease: chronic infection caused by *T. gambiense* which occurs mainly in Central and West Africa and the acute form of the disease caused by *T. rhodensiense*, found in East Africa including Tanzania.

HAT is invariably fatal when untreated. Because of the difficulty and cost of surveillance and treatment, HAT has been considered to have profound impact on the socio-economic development of Africa. It affects mainly the poor community and therefore is not accorded high priority by pharmaceutical companies.

Table 1: Cases of sleeping sickness diagnosed at district hospitals 1996-2001

Region	District	1996	1997	1998	1999	2000	2001
Kigoma	Kibondo	212	115	98	112	134	123
	Kasulu	155	198	172	156	191	79
Manyara	Babati	12	19	15	12	-	-
	Hanang	5	3	8	-	2	-
Arusha	Monduli	-	19	6	-	-	-
Tabora	Urambo	1	-	7	12	9	38
Rukwa	Nkasi	4	-	-	-	-	-
	Mpanda	5	-	-	-	-	-
Mbeya	Chunya	6	-	-	-	-	-
	TOTAL	400	354	326	292	336	240

## Major foci of trypanosomiasis in Tanzania Kigoma

Concern has been expressed about the possibility of larger outbreak of sleeping sickness in Tanzania especially in Kigoma Region, along Lake Tanganyika. The disease represents a continuing threat to the health and morale of many communities in the area. All the districts in Kigoma are affected by sleeping sickness. Kibondo and Kasulu, over the past few years, reported a great proportion of the total cases in the Region.

Outbreak of the disease have been described to occur in a proportion of a large forest, which is said to extend for over an area of 10,368 sq. km. lying between 31°E and 24.7°W 3.5°N and 5.2°S. In the affected area, game is fairly abundant. The people almost unanimously regard the disease as an old one. The areas which are usually worst affected are along the Malagarasi River Valley which has a typical tsetse fly belt where big trees overhang open grassland. The population in this large area is for the most part concentrated in villages on the Kigoma–Kibondo trunk road, infections being contracted mainly by those hunting, fishing, collecting honey and beeswax or travelling in the bush on other occasions in search for basic necessities of life. In some cases people are infected in and near their homes.

There are 32 villages exposed to the risk of infection in Kasulu district, out of these, 22 villages are regarded as the most risk areas. These include Kitanga, Heru Shingu, Nyarugusu, Nyamidaho, Mvugwe, Makere, Mwali, Kitagata, Nyachenda, Mugombe and Nyakitonto. Others are Kagera, Mvinza, Kitema, Titye, Rungwe Mpya and Kaguruka.

In Kibondo, 20 villages are infected by sleeping sickness. These include: - Busunzu, Biturana, Kanembwa, Kitahana, Nduta, Rusohoko, Kumhasha, Kumbanga, Kifura, Nyaruyoba, Kumshindwi, Mkabuye, Nyankwi, Kilemba, Mvugwe, Kazira, Mihunda, Malagarasi, Bitare and Kingoro.

The disease is also prevalent among the refugee from the eastern part of the Democratic Republic of Congo (DRC), settled in camps in Kigoma region. The main concern is the possibility of getting an overlap of gambiense and rhodesiense sleeping sickness in Kigoma. DRC is highly infected with gambiense sleeping sickness.

### Tabora

There is an increase in number of sleeping sickness cases in Tabora region, specifically Urambo district.

This district is bordering Kigoma region and according to the survey carried by the National Institute for Medical Research (NIMR), sequence of 12 villages along the Urambo-Kigoma railway line are affected by sleeping sickness. During this survey the team detected 27 cases. A total of 15 deaths due to sleeping sickness were recorded in Kaliua Health Centre in Urambo district for months of June - December 2001.

### Mara

Since year 2000 there has been a report of 12 tourists being infected by rhodesiense sleeping sickness during their visit to Serengeti National Park. According to the report the tourists were diagnosed and treated in different European countries and the USA.

Serengeti District in Mara region, is an old quiescent focus of sleeping sickness (last case in 1990), however, the screening surveys carried by NIMR in October-December 2001, in the villages around the Park there was no single case of sleeping sickness among game staff and local communities.

### Treatment

Chemotherapy is the main method for control of HAT. It is unfortunate that there is no chemoprophylaxis for HAT and with one exception; no new drug has become available for treatment of either acute or chronic form of the disease during the past 40 years. The treatment of sleeping sickness involves the length and invasive administration of toxic agents such as trivalent arsenicals.

Trypanosomiasis caused by *T. brucei* subgroup is treated by only a handful of drugs such as suramin, diamidines and difluoromethylornithine (DFMO). Suramin and pentamidine are still used to treat patients with primary stage infections that have not involved the central nervous system because they do not pass through the blood-brain barrier to achieve therapeutic levels in the brain (2). Pentamidine, as an isethionate salt is only used against *T. gambiense*. Suramin, a sulphated naphthylamine is effective against an early stage of both *T. gambiense* and *T. rhodesiense*. The drug is given every 5-7 days as an intravenous injection; a course usually comprising of a test dose of 5mg/kg body weight followed by 5 doses of 20mg/kg body weight.

Melarsoprol (Mel B), despite its lethal side effects due to arsenical induced encephalopathy, is the drug of choice for secondary stage infections for both rhodesiense and gambiense sleeping sickness (3). It

is used during the secondary stage when central nervous system manifestations occur. This secondary stage is characterised by the presence of trypanosomes in the cerebrospinal fluid or by elevated levels of protein and numbers of leukocytes. The Mel B is the trivalent arsenical, which comes as 3.6% solution in propylene glycol. The maximum dosage is 3.6mg/kg body weight and treatment schedules consist of 3-4 days, intravenous injections spaced by an interval of at least one-week.

It is clear from the above that treatment of sleeping sickness is complicated. Only recently has a new drug, DFMO. DFMO is efficacious in treatment of human trypanosomiasis caused by *T. b. gambiense* (4). This drug is a selective and an irreversible inhibitor of ornithine decarboxylase, a key enzyme in the biosynthesis of polyamine. This drug was evaluated clinically in 1982-1984 in Sudan for its efficacy against *T.b. gambiense* infections and subsequently registered for use against gambiense sleeping sickness in 1990 (5). The drug has two drawbacks which limit its use; first, intravenous administration of large doses of 400 mg/kg body weight over 14 days which makes its cost to go up to US\$ 250 (3), and secondly, the drug is ineffective against *T. rhodesiense*.

### Control strategies

National Institute for Medical Research, Tabora has submitted a National Sleeping Sickness Control Program (NSSCP) to the Ministry of Health and already some measures have been taken as a starting point to the implementation of the programme. These include:

- Screening surveys to assess the magnitude of disease are carried out along Railway line between Tabora and Kigoma;
- Carrying out screening surveys to local population and game workers and their family in Serengeti and Tarangire National Parks to establish any hot spot of transmission;
- NIMR and Ministry of Health are collaborating to ensure adequate treatment is provided to all cases of sleeping sickness in the foci.

### Causes of persistent infection

The present situation of sleeping sickness in Tanzania especially the persistent infection in Kigoma region and re-emerging of the disease in Tabora region is probably caused by the following factors:

- Poor surveillance activities due to inadequate funding and staff;
- Inadequate and often erratic supply of specific trypanocidal drugs;
- Poorly equipped field laboratories due to lack of essential diagnostic equipment, like microscopes and slides in the health centres of endemic areas;
- Lack of health education campaigns;
- Increased forest activities including cultivation outside the villages or on the buffer zone.

The situation of sleeping sickness in Tanzania is a disappointing setback in the sphere of disease control in the country. The persistence of the infection suggested that a review of the sleeping sickness measures, which are to be applied in the area, might be necessary. The problem that now confronts the country is that sleeping sickness is still endemic and there is laxity of control measures. Comparing with many diseases, the number of human deaths from sleeping sickness appears insignificant, but nevertheless even temporary exacerbation of the disease calls for concern before it is too late. While it is impossible now to predict the future position of the disease in the endemic districts the possibility of a larger outbreak must be considered and with the evidence available at present, it would be a reasonable precaution to step up continuous surveillance and control measures.

### References

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