

# Retrospective study and economic cost of Clinical Bovine Trypanosomosis in nomadic herds in Plateau State, north-central Nigeria

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## Key words

Incidence, economic cost, bovine trypanosomosis, Nigeria

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## 1 SUMMARY

The incidence, pattern and economic cost of cases of clinical bovine trypanosomosis in nomadic herd at Jos Plateau were determined from 1997 to 2001. Records kept at the Plateau State Ministry of Animal and Forest Resources at Jos were analysed using the model described by Alonge *et al.* (year 1984). The incidence of clinical bovine trypanosomosis was 1.3% with a mortality rate of 21.7%. The annual average mortality was 0.3%. The economic loss due to mortality and miscellaneous costs during the five-year period was estimated at 1.02 billion Naira, with an average annual lost of 204.1 million Naira. Proper control programme should be instituted immediately to curb the increasing incidence with its attendant socioeconomic consequences.

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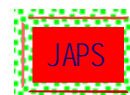
## 2 INTRODUCTION

Trypanosomosis, a disease caused by trypanosome, is one of the most ubiquitous and important constraints to cattle production in Nigeria (Ikede, 1972; George & Richard, 1982; Kalu, 1996; Swallow, 2000; Shamaki *et al.*, 2002). Approximately 80% of the total land mass is presently under the scourge of the disease vector, the tsetse fly and this endemic disease. The disease is characterised mainly by anaemia, weight loss, infertility and mortality, leading to colossal losses amounting to billions of naira, and devastation of the Nigerian cattle population (Swallow, 2000). The pest has continued to spread to parts of the country which were hitherto thought to be free of the disease, despite efforts to control it.

The Jos Plateau in north-central Nigeria, which was previously said to be tsetse fly and trypanosomosis free due to its high altitude

and temperate climate, has recently been reported to have been invaded (Kalu, 1996). Infection rates ranging from 7.5 to 10.0% have been reported amongst nomadic and sedentary herds in these areas (Kalu, 1996; Kalu & Uzoigwe, 1996; Kalejaiye *et al.*, 2001; Shamaki *et al.*, 2002; Yanan *et al.*, 2003). Due to the hitherto virgin nature of Jos area in Plateau State, little studies were done to determine the epidemiology and economic impact of the disease.

This study, therefore, aimed to investigate the incidence and pattern of clinical bovine trypanosomosis, the economic loss due to mortality, carcass or organ condemnation and other miscellaneous costs. This was aimed at providing necessary data that could be used towards developing a strategy for controlling the disease.



### 3 MATERIALS AND METHODS

Reports of cases of trypanosomosis in nomadic cattle herds in Plateau State from 1997 to 2001 were obtained from records kept at the Plateau State Ministry of Animal and Forest Resources Headquarters, Jos (Veterinary Service Department). The State is located in the high plateau within the Guinea Savannah Zone of north-central Nigeria. The data collected included cattle population in the herds, clinical cases of trypanosomosis, resultant mortality and abattoir condemnation. Economic loss due to the incidences and mortality was determined using the formula of Alonge *et al.* (1984), as follows:

$$EL = ND(PA \times BW) + MC$$

where

EL = Estimated annual economic loss

ND = Number of animals that died due to the disease

PA = Average market price of 1kg of beef

BW = Average weight of Nigerian cattle in kg

### 4 RESULTS

The total cattle population in the nomadic and sedentary herds concerned, incidence of bovine trypanosomosis, mortality and fatality rates during the 5 years of study are shown in Table I and Figure 1. Eighty-nine thousand and forty-two (1.3%) out of 6.68 million cattle were reported to have clinical conditions with 19,284 (21.7%) of the clinical cases resulting in death. Annual incidence rates ranged from 0.4 to 2.4%. The highest incidence rate occurred in 1999 while 1998 recorded the lowest. High fatality rates were observed during the 5-year period; the highest (23.8%) occurring in 2001 and the lowest (17.9%) in 1999. Figure 1 clearly shows that in spite of the low incidence rate (0.4%) observed in 1998, the

MC = Miscellaneous cost (drugs, labour etc which is 5% of ND (PA x BW).

According to Alonge *et al.* (1984), the formula is based on the finding that diseases like trypanosomosis lead to (1) Mortality in acute cases, and indirectly through predisposition to other diseases; (2) Chronic effects, resulting in poor productivity (Isoun & Anosa, 1974) due to abortion, testicular degeneration, zoospermia and infertility; (3) Organ or carcass condemnation at slaughter and other effects like poor carcass quality and decreased milk yield.

The formula uses the average weight of Nigerian cattle which is estimated to be 180kg (FAO, 1986), and the average price of beef per kg from 1997 to 2001 which was ₦280 in Plateau State (Okeke, 2002). The data collected were subjected to descriptive analysis (Best, 1979) and consequence to determine the level of significance of yearly and total economic loss.

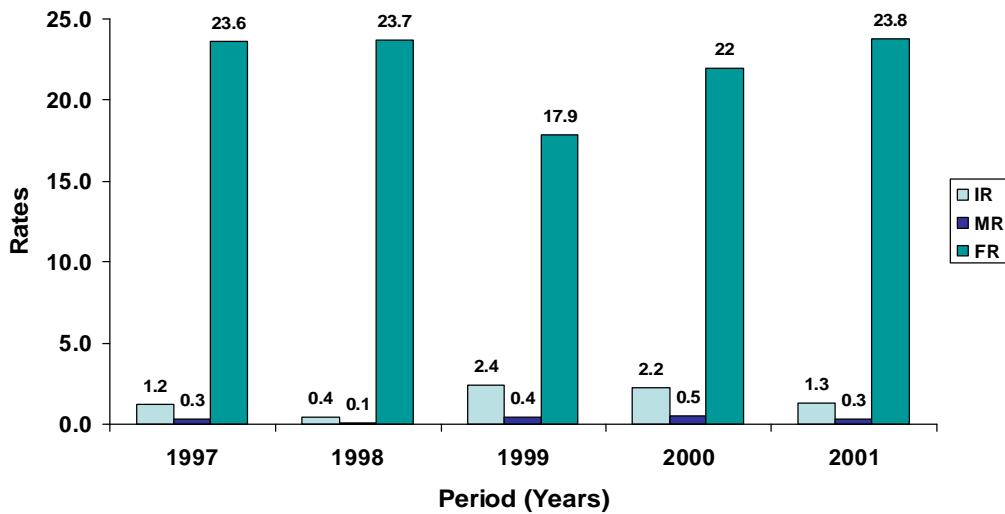
fatality rate was very high (23.7%). However, the mortality rate (0.1%) recorded the same year was the lowest. The year 2000 recorded the highest mortality rate (0.5%). The mortality rates based on economic implication were statistically significant ( $0 < 0.05$ ).

The annual and total economic loss due to clinical bovine trypanosomosis is shown in Table II and Figure 2. The total loss due to mortality and miscellaneous cost within the 5-year period was 1.0204 billion naira with an annual average loss of 0.2041 billion naira. High economic losses ranging from 245.6 million naira in 1997 to 272.3 million Naira in 2000 were incurred.

**Table 1:** Incidence of clinical cases, mortality and fatality rates of bovine trypanosomosis in Plateau State, Nigeria from 1997 – 2001.

Year	Cattle population (x 10 <sup>6</sup> )	No. clinical cases (%)	No. dead animal (%)*	Fatality rate (%)
1997	1.70	19,658 (1.2)	4,642 (0.3)	23.6
1998	1.80	7,548 (0.4)	1,791 (0.1)	23.7
1999	1.05	24,694 (2.4)	4,430 (0.4)	17.9
2000	1.06	23,395 (2.2)	5,146 (0.5)	22.0
2001	1.07	13,747 (1.3)	3,275 (0.3)	23.8
<b>Total</b>	<b>6.68</b>	<b>89,042 (1.33)</b>	<b>19,284 (0.3)</b>	<b>21.7</b>
<b>Annual average</b>	<b>1.34</b>	<b>17,808.4 (1.33)*</b>	<b>3,856.8 (0.3)</b>	<b>21.7</b>

\*Mortality rate (%)

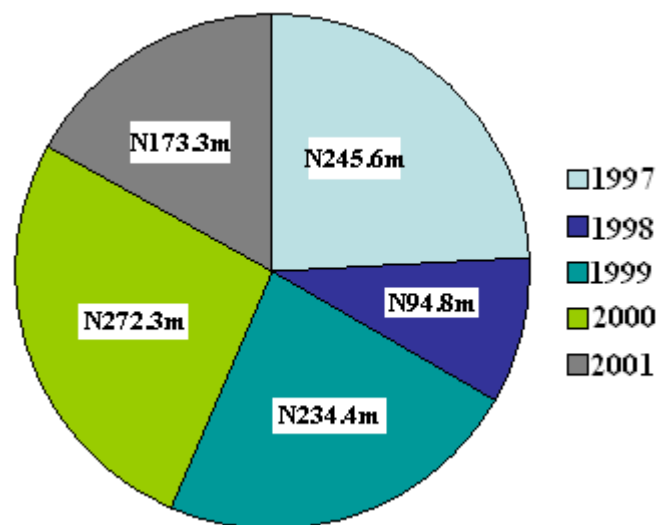


**Figure 1:** Summary of incidence, mortality and fatality rates due to clinical bovine trypanosomosis in Plateau State

**Table 2:** Economic losses due to clinical bovine trypanosomosis in Plateau State, Nigeria from 1997 – 2001

Year	ND	EL (₦) x 10 <sup>6</sup>	EL (USD) x 10 <sup>6</sup>
1997	4,642	245.6	3.3
1998	1,791	94.8	1.3
1999	4,430	234.4	3.2
2000	5,146	272.3	3.7
2001	3,275	173.3	2.3
<b>Total</b>	<b>19,284</b>	<b>1,020.4</b>	<b>13.8</b>
<b>Annual average</b>	<b>3,856.8</b>	<b>204.1</b>	<b>2.8</b>

ND = Number of animals that died due to the disease; EL = Estimated annual economic loss.



**Figure 2:** Annual economic losses due to clinical bovine trypanosomosis in Plateau State, Nigeria (1997 – 2001).

## 5 DISCUSSION

The incidence of clinical bovine trypanosomosis (1.3%) obtained in this study is similar to that

obtained by Adua (2000) in Barkin Ladi, Southern part of Plateau State of Nigeria. He stated that of

all the cases of bovine trypanosomosis (clinical and subclinical) recorded in the Local Government Area between 1995 and 1999 only 1.1% manifested clear clinical signs. Our findings are also similar to those of Lalang *et al* (1993) indicating 1.2% incidence in Mangu Local Government Area of Plateau State close to that reported by NITR (1999) and Yanan *et al* (2003) estimating incidences for clinical cases at 1.7 and 1.2%, respectively, in Plateau State.

The total economic loss within the 5-year period was estimated at 1.02 billion naira (13.8 million USD) as a result of 19,284 deaths, carcass condemnation and other miscellaneous costs. The economic losses recorded in this study are lower

than those reported in the neighbouring state of Benue State (Saror, 1988). This may be due to the higher incidence rate (15.8%) and mortality rate (1.05%) in that State, which is an endemic area, compared to Plateau State where the disease was considered to be just emerging at the time of this study. Besides personal agony experienced by the cattle farmers, the disease has contributed to a decline in farmers' income, and the general livestock industry. Based on the findings of this, and previous studies, the view that Plateau State is a trypanosomosis free zone should be discarded. A proper programme for the control of the vector and the disease should be instituted before the State becomes overwhelmed.

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