



KALRO VETERINARY SCIENCE RESEARCH CENTRE - ALUPE

Tsetse and trypanosomiasis (T&T) surveillance in support of HAT elimination in Kenya

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Background

- ❑ Zoonotic African trypanosomiasis transmitted by tsetse flies constrains livestock production in Sub-Saharan Africa, and is endemic in Kenya.
- ❑ Since 1977, Kenya Trypanosomiasis Research Institute (KETRI) was mandated to undertake research towards reclamation and effective utilization of Tsetse infested lands.
- ❑ A one health strategy was adopted, where technologies were applied for tsetse vector suppression and infected animals and humans were treated with trypanocides.
- ❑ To date, T&T menace has been effectively contained and, Kenya and WHO has both validated elimination of rhodesiense human African trypanosomiasis (rHAT) as a public health concern in Kenya.
- ❑ We present T&T surveillance data by KALRO and KENTTEC post-intervention.

Why African Trypanosomiasis Matters

- ❑ Human population at risk: 55 million people (3 million at moderate-high risk particularly in rural and agricultural areas (WHO, 2023).
- ❑ Annual losses in cattle production alone to be \$5 billion
- ❑ 50 million cattle and 70 million sheep and goats are at risk of AAT
- ❑ Approximately 3 million cattle die annually due to AAT
- ❑ 10 million square kilometers of arable land in Africa is occupied by tsetse flies.

One Health Strategy

Animal Treatment

Infected livestock treated with effective trypanocides to prevent disease spread

Vector Suppression

Advanced technologies applied for tsetse fly control and population reduction

Human Care

Comprehensive screening and treatment programmes for affected human populations

This integrated approach has proven highly effective, with Kenya and WHO validating the elimination of rhodesiense human African trypanosomiasis (rHAT) as a public health concern.

Research Methodology

Study Area

❑ Data collected from six counties representing four of Kenya's six tsetse belts:

- Busia
- Bungoma
- Turkana
- Siaya
- Baringo
- Narok

Surveillance Approach

- ❑ Cross-sectional surveys conducted by multidisciplinary teams of veterinarians, doctors, and entomologists using purposive sampling methods.
- ❑ Resource-dependent screening covered 75-100% of presented animals and humans for comprehensive disease monitoring.

Research Methodology

HAT/AAT Diagnostic Methodology

- ❑ Quantitative buffy coat technique
- ❑ Mice inoculation as a confirmatory test for rHAT

Entomological surveillance

- ❑ Deployment of odor baited traps:
 - Biconical trap
 - Ngu trap
- ❑ Bait:
 - Acetone
 - Phenol Satchet

Animal Screening Results

19,927

Animals Screened

Comprehensive surveillance across
six counties from 2000-2025

6.82%

Peak Prevalence

Maximum trypanosomiasis
prevalence recorded during
study period

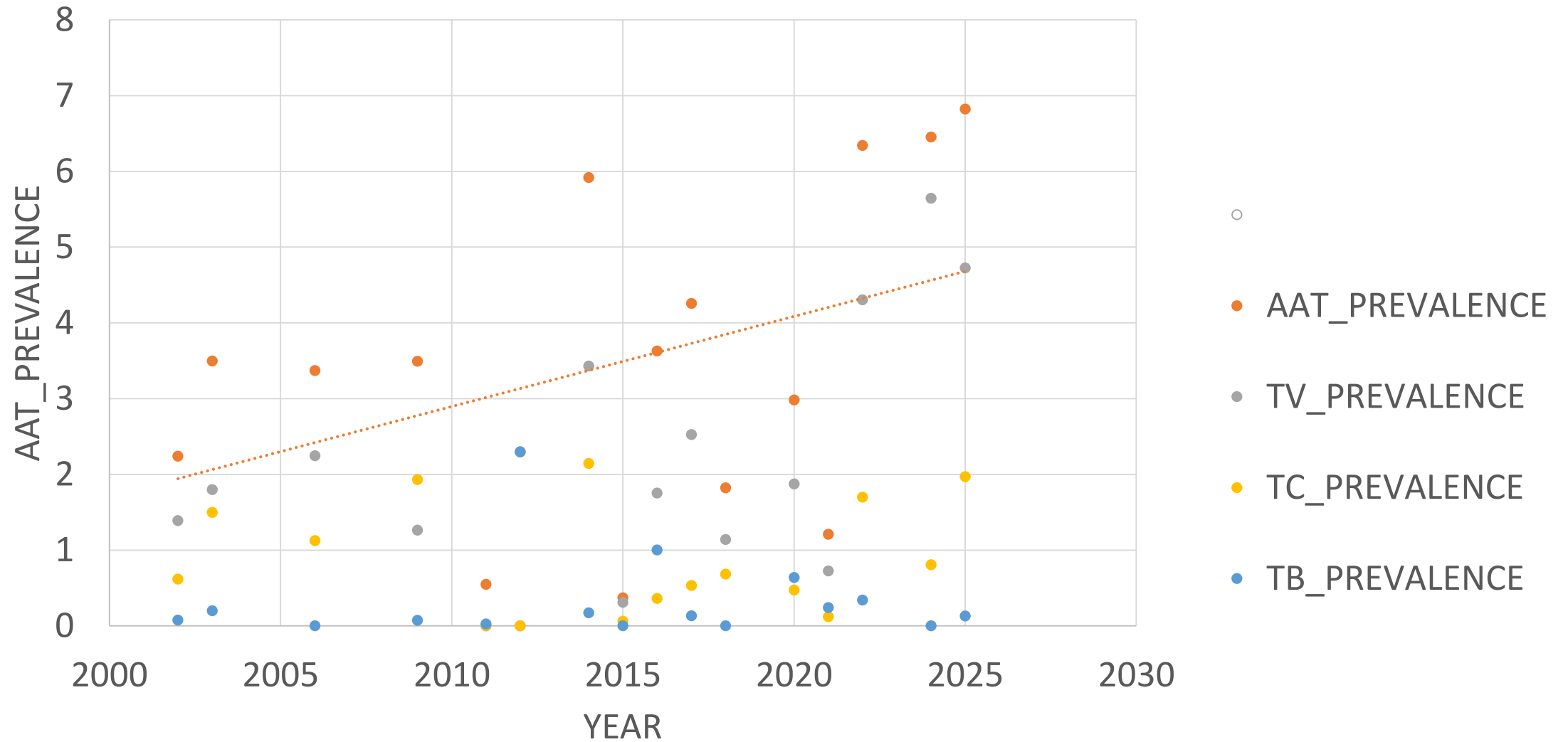
0%

Minimum Prevalence

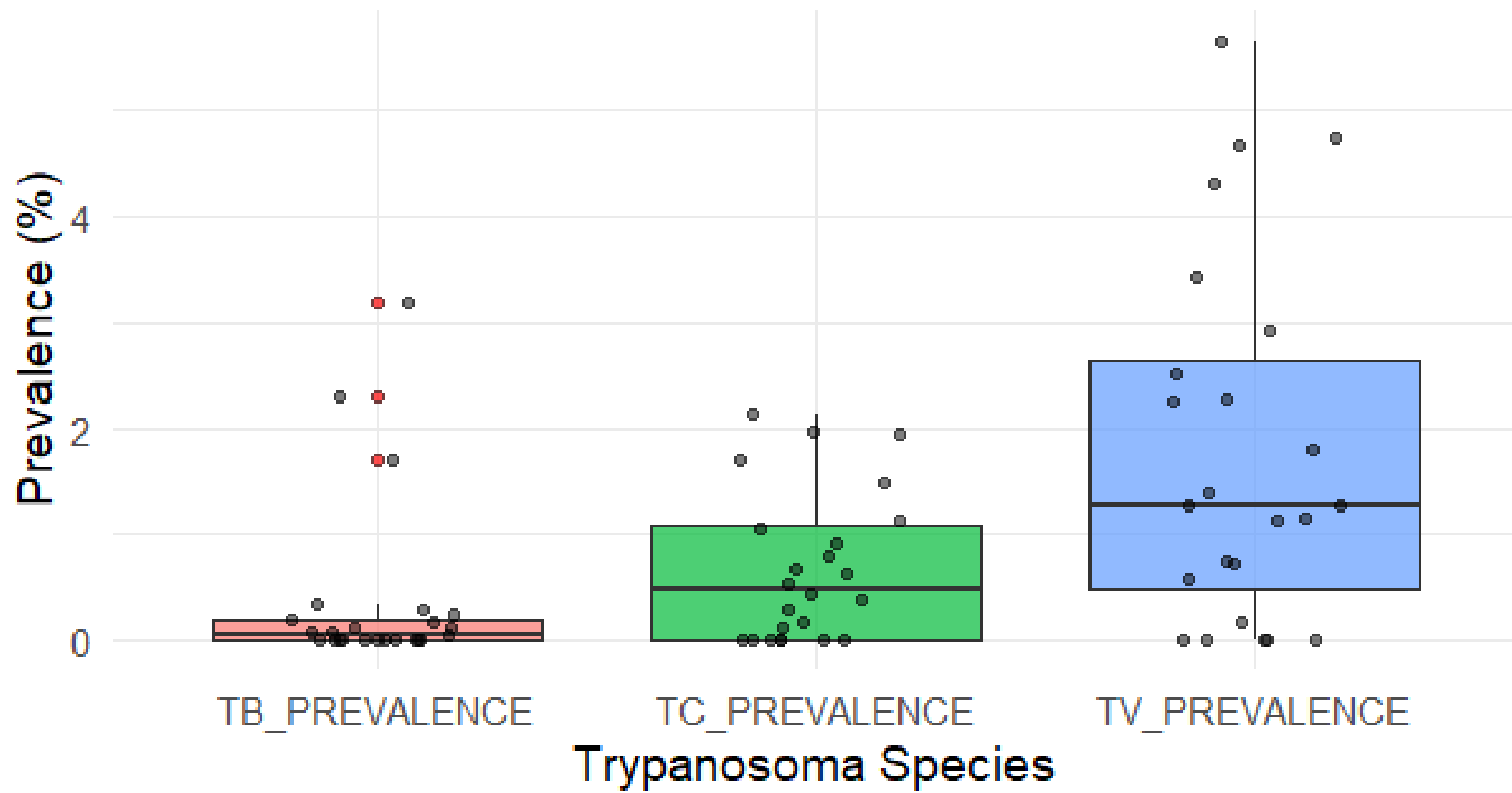
Achieved in recent years,
demonstrating control
effectiveness

- ❑ Trypanosomiasis mean prevalence varied significantly between 0 - 6.82% throughout the 25-year study period, showing marked improvement over time.
- ❑ *T. vivax* prevalence was significantly higher than *T. congolense* and *T. brucei* ($F=9.8$, $P=0.0001$)

KENYA AAT_PREVALENCE Data (2000 – 2025)



Prevalence of Trypanosoma Species



Tsetse Fly Population Decline

1

2001 Baseline

FTDs recorded at 4.3 flies per trap per day

2

Intervention Period

Systematic vector suppression using insecticide-impregnated targets

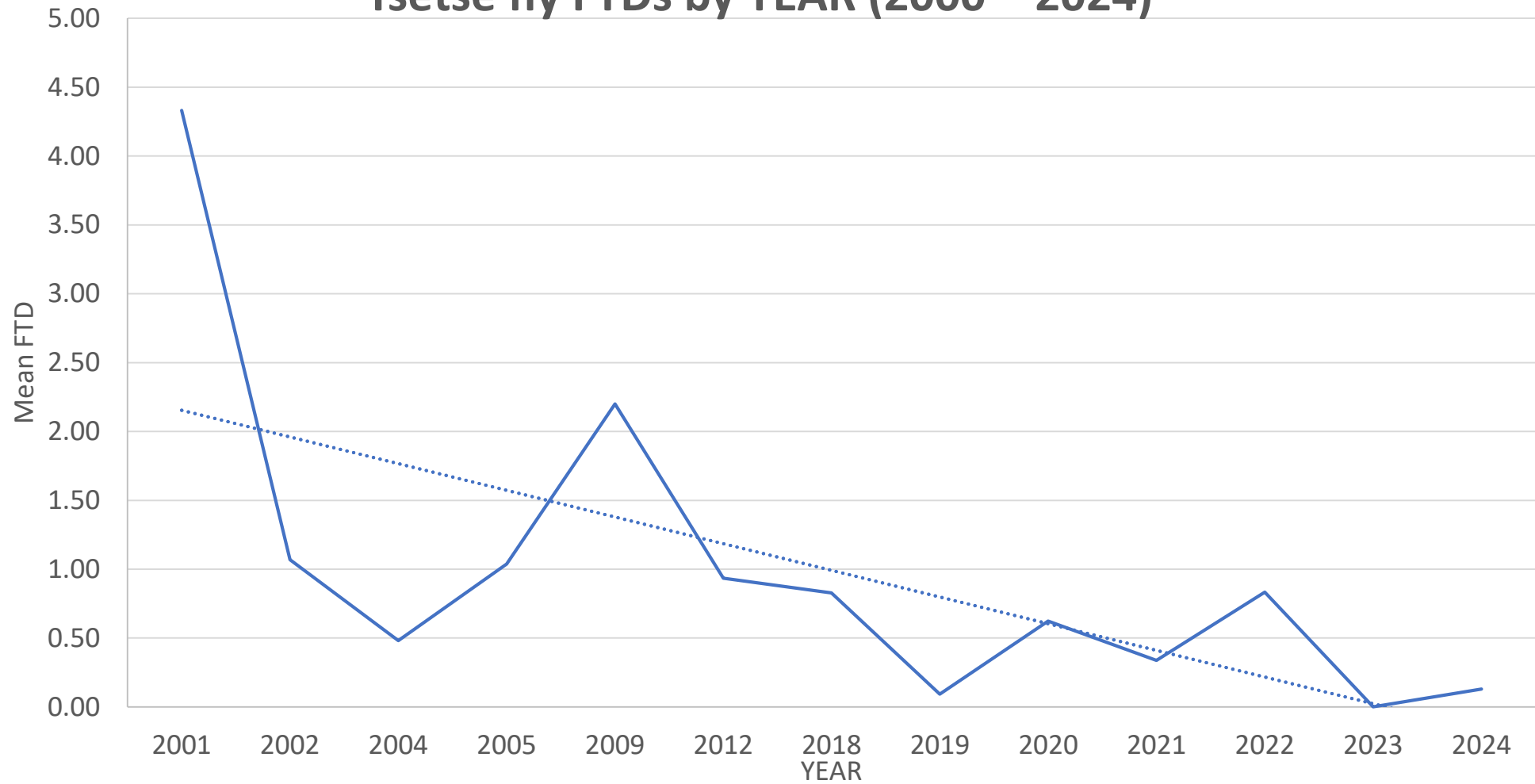
3

2024 Achievement

FTDs gradually reduced to 0.13 flies per trap per day

Glossina fuscipes fuscipes and *Glossina swynertonii* showed significant differences ($p = 0.037$), but not with *Glossina pallidipes* which was predominant. FTDs and tsetse infection rates demonstrated positive correlation (PC - 0.669, $p = 0.036$).

Tsetse fly FTDs by YEAR (2000 – 2024)

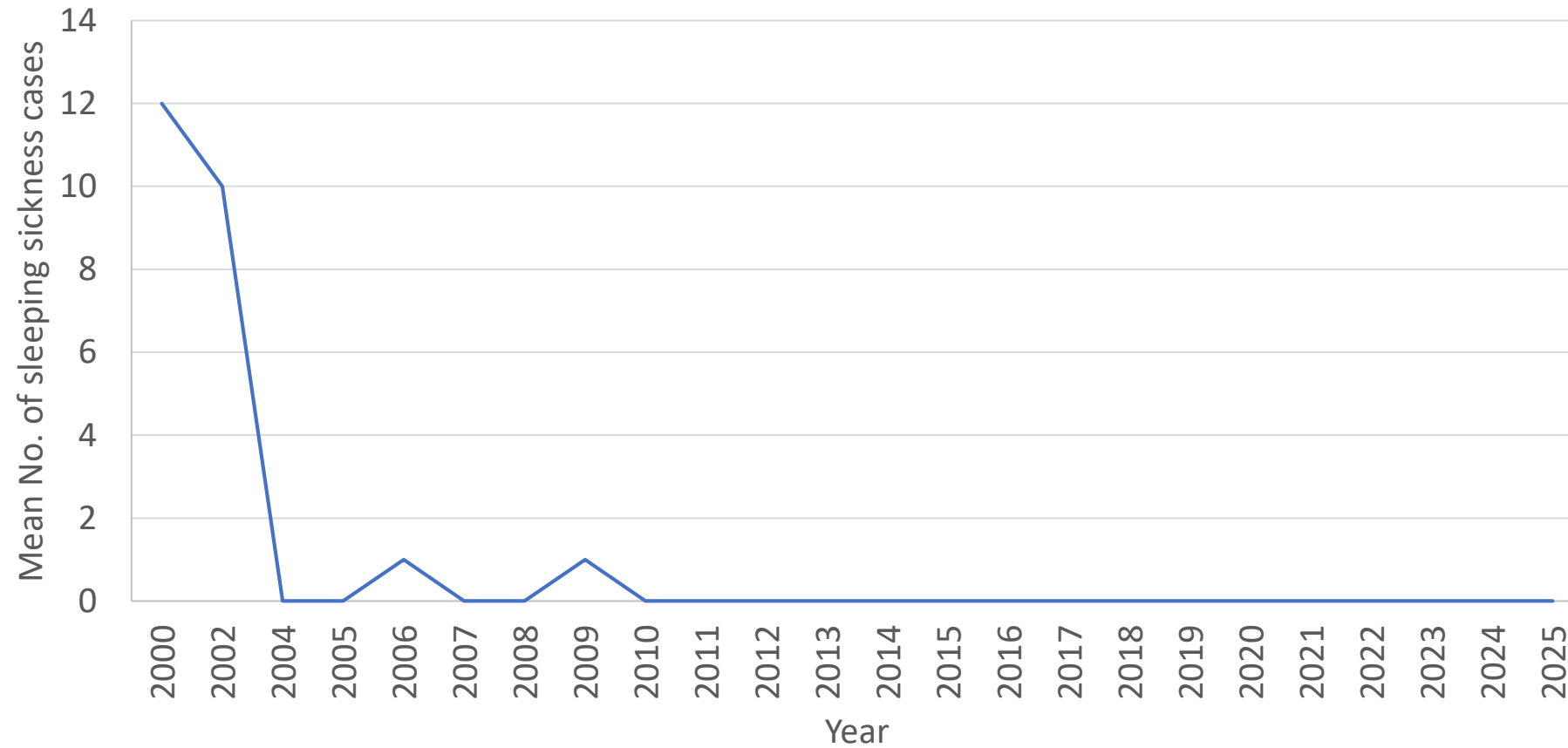


Human African Trypanosomiasis Elimination



Of 14,565 people screened for HAT, positive cases dropped from 12 in 2000 to 1 in 2009, with no gender disparity observed ($p > 0.05$). Health facilities in HAT-endemic areas continue monitoring flu-like syndromic patients.

Simple Line Mean of No. of sleeping sickness cases by Year



Key Findings and Implications

Elimination of SS as a public health concern in Kenya

- Kenya rHAT elimination validated by WHO
- Last autochthonous case reported in 2009
- Risk of resurgence due to persistent presence of zoonotic *T. brucei* reservoirs

AAT prevalence

- Persistent high prevalence despite ongoing tsetse control efforts
- Low prevalence of *T. brucei*
- High prevalence of *T. vivax*

Tsetse fly density

- Gradual reduction in FTDs.
- Gff and Gdp are the main tsetse species in the region

Recommendations

- ❑ Structured surveillance of HAT – syndromic and or molecular for cases with high likelihood of suspicion Index
- ❑ Continued surveillance of AAT in animal hosts given that T.b is in circulation



Tsetse and trypanosomiasis (T&T) surveillance in support of HAT elimination in Kenya

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