Investigating clinical and epidemiological profile of rhodesiense Human African Trypanosomiasis in Vwaza Marsh, Rumphi, Malawi

P2-F14

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Public Health Challenge: rhodesiense Human African Trypanosomiasis continues to be a significant health issue in the Vwaza Marsh Catchment area, complicated by its nonspecific clinical presentation, leading to delayed diagnosis and poor patient outcomes.

Knowledge Gap: There is a lack of comprehensive clinical and epidemiological profiling of rHAT, and addressing this gap is critical to improving early diagnosis and management for better disease outcomes.

BACKGROUND

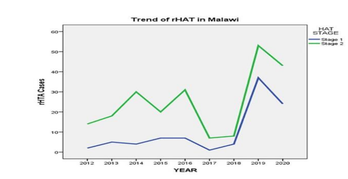
- Disease Overview: Rhodesiense Human African Trypanosomiasis (rHAT) is a life-threatening disease endemic to East and Southern Africa, transmitted by tsetse flies, with Rumphi District, Malawi, being a hotspot due to its proximity to tsetse fly habitats.
- Challenges in Diagnosis: rHAT symptoms overlap with other tropical diseases like malaria and HIV, leading to delayed diagnosis and treatment, while the role of co-infections and socio-demographic factors remains poorly understood.
- Research Gap: There is a lack of comprehensive data on the clinical and epidemiological characteristics of rHAT in Malawi, complicating early clinical decision-making, which this study aims to address by profiling the disease and identifying predictors of progression and outcomes.

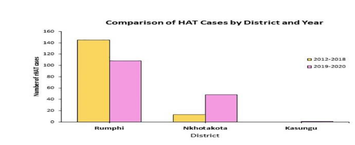
AIM

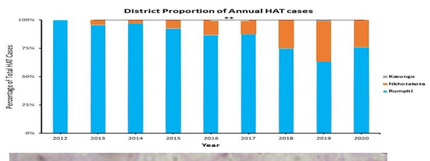
To describe the Tb rHAT clinical and epidemiological profile and their impact on patient outcomes, in Rumphi district, in Malawi

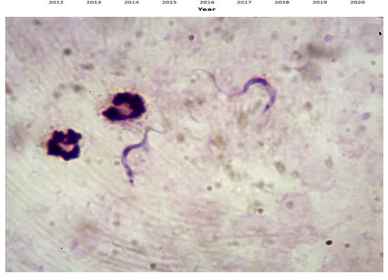
SPECIFIC OBJECTIVEs

To characterize the socio-demographic profile of patients diagnosed with Tb rHAT.
To describe the clinical profile of Tb rHAT, including common symptoms, physical findings, co-morbidities, and laboratory results at Rumphi district, in Malawi.
To assess and describe predictable clinical factors associated wAith Tb rHAT clinical case presentation and its outcomes.



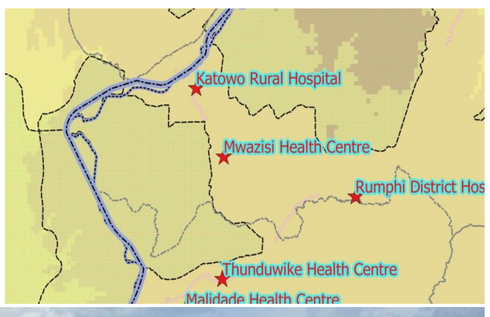


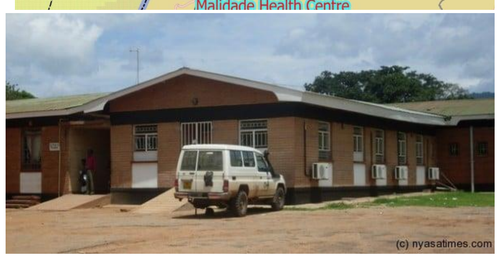


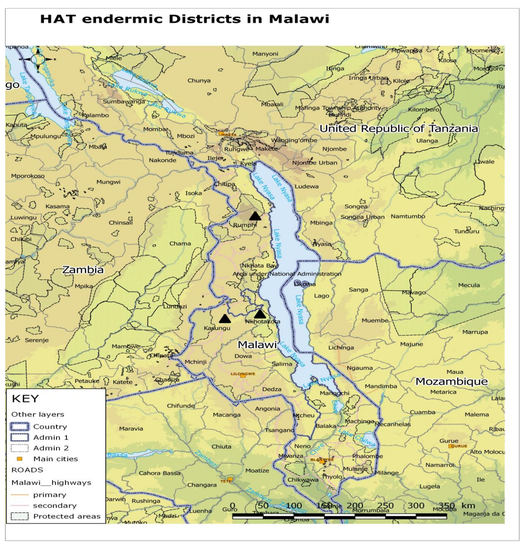


METHODS

- Study design: The retrospective cohort design is an efficient, ethical approach for studying HAT, enabling the analysis of long-term outcomes using existing data, despite potential limitations like data quality and unmeasured confounding.
- Target Population and setting: The study population includes all patients aged 6 and above diagnosed with *rHAT* at Rumphi District Hospital between 2012 and 2024, meeting specific inclusion criteria such as parasitological confirmation, documented symptoms, and living within the Vwaza catchment area.
- Data management plan: The study will review anonymized medical records of 209 *T. b. rhodesiense* HAT patients treated at Rumphi District Hospital from 2012 to 2024, securely storing and analysing data using RevMan v5.4.1 and Stata software v18 for analysis, with plans to share the findings under a Creative Commons license for unrestricted use and credit.







METHODS…

Study Design: Retrospective Cohort study (medical records between 2014-2024)

Study Setting:
- Vwaza wildlife reserve area
- Rumphi District Hospital (Secondary level facility)

Estimated minimum sample size: 209

Objective	Type of Analysis	Variables	Statistical Test/Model	Coding Plan	Data Cleaning Plan	Missing Data Management	Extreme Values
1. Describe the clinical and epidemiological profile	Descriptive Statistics	Age, sex, occupation, clinical symptoms, co-infections	Means/medians for continuous variables; Frequencies and percentages for categorical variables	Categorical variables: coded as 1/0 for binary data (e.g., co-infections yes = 1, no = 0); continuous variables: recorded as numeric	Ensure no duplicate entries, check for correct data formats (e.g., date formats for diagnosis and treatment), validate data entry accuracy	Missing data points handled via listwise deletion for key variables or imputation (e.g., mean or median imputation) for continuous variables	Use boxplots to identify outliers and perform sensitivity analysis by including and excluding extreme values
2. Compare disease progression based on co-infections	Comparative Analysis (Univariable)	Disease stage (Stage 1 vs Stage 2); presence of co-infections	Chi-square or Fisher's exact test (categorical); T-test or Mann-Whitney U test (continuous)	Disease stage: coded as Stage 1 = 0, Stage 2 = 1; Co-infections: coded as yes = 1, no = 0	Identify invalid or out-of-range values (e.g., age above biological limits); flag and correct inconsistencies through manual review	Missing data points for categorical variables handled using dummy category for unknown/missing values	Investigate extreme values through histograms; consider winsorization for extreme continuous values
3. Identify predictors of disease progression and outcomes	Multivariable Logistic Regression	Age, sex, co-infections, proximity to tsetse habitats, etc.	Logistic regression; Odds ratios (OR) with 95% confidence intervals	Continuous variables: age coded in years, proximity to tsetse fly habitats coded in km	Check for multicollinearity (Variance Inflation Factor), and correct data inconsistencies	Apply multiple imputation methods for variables with more than 5% missing data to avoid loss of statistical power	Remove extreme values that distort logistic regression results; conduct robustness checks with and without outliers
2&3. Time-to-event analysis (disease progression)	Survival Analysis	Time to disease progression (Stage 1 to Stage 2), co-infections	Kaplan-Meier survival curves; Log-rank test; Cox proportional hazards model	Time-to-event data coded in days or weeks from diagnosis to progression	Ensure time variables are correctly formatted and no negative time values	Use survival imputation methods (e.g., Kaplan-Meier) for missing time-to-event data	Flag extreme time values (e.g., exceptionally long disease progression times) for manual review
1&3. Examine effect of socio-demographic factors on outcomes	Multivariable Analysis	Age, sex, occupation, proximity to tsetse habitats	Multivariable logistic regression; Adjusted odds ratios (aOR)	Categorical variables: Occupation coded as high-risk = 1, low-risk = 0	Address inconsistent occupational data; standardize categories across records	Use sensitivity analysis to evaluate the impact of missing socio-demographic data on results	Identify and handle outliers in continuous demographic variables using z-scores or robust statistical methods

ETHICS

Ethical Approval and Data Handling: The study will be submitted for ethically approved by Stellenbosch University Health Research Ethics Committee, South Africa, following recommendation from Rumphi district hospital, Malawi, using anonymized retrospective data with permissions from data custodians instead of direct consent.

ADDITIONAL KEY INFORMATION

Author Contact Information: nyirendatizgo@gmail.com
Funding Source: Stellenbosch University for WCE conference funding.
: The author reports Nonspecific research funding
Conflicts of Interest: Authors report no conflict of interest
Acknowledgements: Special appreciation to the Malawi Ministry of Health, government of Malawi, for funding my MSc Clinical Epidemiology training.

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