



THE 33RD ANNUAL JOINT SCIENTIFIC CONFERENCE

**Universal Health Coverage: Building a Resilient
Health System to Achieve Tanzania's Development
Vision 2050**

09th to 11th June 2026

**Arusha International Conference
Centre (AICC)**

**Abstract Book
2026**

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Background

The National Institute for Medical Research (NIMR) is a parastatal organization established to conduct, regulate, coordinate and promote health research that is responsive to the needs and well-being of Tanzanians. Stakeholders served by the Institute include healthcare professionals, researchers, decision makers, policymakers, media and the public in Tanzania.

Dissemination of health research findings and other outputs is among the strategies that the Institute uses to ensure that potential consumers — including healthcare professionals, researchers, decision makers and policymakers, media and the public — are reached. To this end, the Institute calls upon all local and international stakeholders to participate in the 33rd Annual Joint Scientific Conference (AJSC 2026) to be held at AICC Arusha, Arusha, Tanzania from June 9-11, 2026.

This annual gathering provides a platform where evidence-based solutions aimed at addressing health problems are shared and discussed. The main theme for the 33rd Annual Joint Scientific Conference is: *Universal Health Coverage: Building a Resilient Health System to Achieve Tanzania's Development Vision 2050*.

The conference sub themes cover communicable and non-communicable diseases, nutrition, maternal, newborn, child and adolescent health, climate change, community and health systems including universal health coverage, neglected tropical diseases, traditional medicine, artificial intelligence and digital health technologies, and emerging and re-emerging infectious diseases.

Apart from highlighting the critical role of research in enhancing healthcare delivery, the conference delves into health systems strengthening and the key building blocks which include service delivery, workforce, and health financing. Furthermore, discussions will be centred around multisectoral engagement in disease prevention, impact of climate change on health, and the link between nutrition and health.

Foreword

Dear authors and esteemed readers,

It is with deep pleasure that I write this Foreword of the 33rd Annual Joint Scientific Conference (AJSC 2026) to be held at AICC Arusha, Arusha, Tanzania from June 9-11, 2026. I hope that world experts in health research, vendors and suppliers of health technologies, students and academics, policy and decision makers, journalists and the public at large will have meaningful interaction during the conference and will be able to come up with resolutions to close the identified gaps.

The main theme for the 33rd AJSC is: *Universal Health Coverage: Building a Resilient Health System to Achieve Tanzania's Development Vision 2050*. The conference sub themes cover a broad scope of health research conducted in Tanzania and the surrounding region, reflecting the multidisciplinary nature of modern health science.

I trust that this Abstract Book will furnish scientists from around the world with excellent reference material and serve as a stimulus for further health research. I thank all authors and participants for their valuable contributions.

Prof. James E. Mdoe

Chairperson, NIMR Council

Arusha, June 9-11, 2026

About the Annual Joint Scientific Conference

The Annual Joint Scientific Conference (AJSC) traces its origins to three years after the establishment of the National Institute for Medical Research (NIMR) by an Act of Parliament of the United Republic of Tanzania. The AJSC provides a platform to disseminate evidence generated through various research activities implemented in and outside the country.

The conference takes place with the aim of:

1. Bringing world experts in health research together in one location.
2. Disseminating and sharing results of health research with key stakeholders and the public.
3. Exhibiting the latest health technologies and innovations.
4. Networking, and exploring new health research priority areas.

In the early years the conference was moderated in a single plenary session. As time went on, attendance expanded from a small number of NIMR staff to more than a thousand participants from different parts of the world in recent years. Currently, the mode of presentation has adopted a combination of parallel and plenary sessions, symposia and roundtable discussions.

The AJSC has proven to be the premier venue for NIMR visibility as well as establishing new connections and collaborations within and outside Tanzania. It serves as the best forum for the exchange of research information with policymakers, media and the public at large.

Sub Themes

The 33rd Annual Joint Scientific Conference covers 8 sub themes, reflecting the broad scope of health research conducted in Tanzania and the surrounding region.

- 1. Non-Communicable Diseases, Injuries, Nutrition, Mental Health, and Co-morbidities**

- 2. Communicable Diseases and Antimicrobial Resistance**

- 3. Neglected Tropical Diseases**

- 4. One Health and Climate Resilience: Mitigating Emerging and Re-emerging Disease Threats**

- 5. Maternal, Child, Adolescent, and Reproductive Health**

- 6. Traditional, Complementary, and Integrative Medicine**

- 7. Artificial Intelligence and Digital Health Technologies**

- 8. Health Systems Strengthening for UHC and National Health Security**

Artificial Intelligence and Digital Health Technologies

16 Abstract(s)

OR-AI-01

Harnessing the Power of Cough Sounds for AI-Powered Diagnosis of Multiple Respiratory Diseases in Low-Income Africa: The Kikohozi Classifier Project

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Background: Respiratory diseases, including tuberculosis (TB), asthma, and chronic obstructive pulmonary disease (COPD), remain major health challenges in Tanzania, where diagnostic capacity is limited. Patients often face barriers accessing specialized facilities, contributing to delayed diagnosis and treatment. Advances in artificial intelligence (AI) offer new opportunities for scalable, non-invasive diagnostics.

Objective: To develop the Kikohozi Classifier, an AI-powered diagnostic tool capable of identifying TB, asthma, and COPD from cough sounds in primary healthcare and community settings across semi-urban and rural Tanzania.

Methods: This study is establishing the Kikohozi-DB, Africa's first large-scale cough sound database, by recruiting 30,000 participants and linking cough recordings to verified clinical diagnoses. Data are currently collected in healthcare facilities in collaboration with the National TB and Leprosy Program as well as in community settings. Using advanced AI/ML methods, cough audio is being preprocessed, relevant features extracted, and diagnostic models (Kikohozi-AI) trained and validated for real-world application across diverse devices and demographics.

Results: Since the initiation of data collection, a total of 4,447 cough sound recordings have been obtained from 890 participants. The study cohort comprised individuals diagnosed with tuberculosis (TB), asthma, COPD, and multiple respiratory conditions. Among the participants, 474 (53.3%) had confirmed clinical diagnoses. Specifically, 312 (35.1%) were diagnosed with tuberculosis, 124 (13.9%) with asthma, 28 (3.1%) with COPD, and 10 (1.1%) presented with multiple respiratory conditions. The remaining 416 participants (46.7%) were classified as healthy controls. Preliminary analyses suggest that cough acoustic features show potential to distinguish among major respiratory conditions. We anticipate presenting more robust findings, including preliminary performance metrics, at the conference.

Conclusion: The Kikohozi Classifier provides a low-cost, scalable diagnostic model for TB, asthma, and COPD in resource-limited settings. The project contributes directly to SDG 3.3 on TB elimination and SDG 3.4 on reducing premature mortality from non-communicable diseases.

KEYWORDS: Artificial intelligence; Machine learning; Respiratory diseases; Tuberculosis; Asthma; Tanzania

OR-AI-02

Clustering, profiling, and association of traumatic brain injury phenotypes with clinical outcomes in adult patients at Kilimanjaro Christian Medical Centre using unsupervised machine learning, 2020-2025

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Background: Traumatic brain injury (TBI) is a major cause of disability and death, with low- and middle-income countries (LMIC) like Tanzania facing a particularly high burden due to road traffic injuries. While the GCS remains vital, it is challenged to oversimplify the diverse clinical and pathophysiological features of TBI. Hidden patient phenotypes may go unrecognized, limiting opportunities for individualized care.

Objective: This study aimed to identify and characterize distinct TBI phenotypes using UML and examine their association with clinical outcomes at KCMC from 2020-2025.

Methods: 1,282 TBI patients at the KCMC trauma registry were analyzed from 2020-2025. The Python programming language was used for descriptive statistics, model building, evaluation, and feature importance. The main outcome in this study was the Glasgow Outcome Scale-Extended (GOSE). Length of hospital stay (LOS), Intensive Care Unit (ICU) admission, and surgical interventions were the secondary outcomes. Three models were derived: K-Means, Gaussian Mixture Models (GMM), and Agglomerative Hierarchical algorithms. Logistic regression assessed the associations between phenotype membership and functional outcome.

Results: 282 patients analyzed, the median age was 30 years (IQR 24-41), and 1,124 (87.7%) were male. Among the three algorithms, GMM-derived phenotypes were selected as a final model, which identified four clinically distinct phenotypes: Mild TBI-young adults 648 (50.5%), Mild TBI-Older Adults 377 (29.4%), Moderate-Severe TBI 155 (12.1%), and Mild TBI with Abnormal Pupils 102 (8.0%). The Moderate-Severe TBI phenotype showed the poorest prognosis, with 121 (78.1%) having unfavorable GOSE, LOS, and ICU admission. After adjustment, membership in this phenotype increased the odds of an unfavorable outcome (AOR: 3.99; 95% CI: 2.63-6.08; $p < 0.001$).

Conclusion: This study shows that UML can reveal clinically relevant TBI phenotypes with clear prognostic value using routine ED data. These findings highlight the potential for data-driven clustering to strengthen early risk stratification and support more individualized care.

KEYWORDS: Traumatic brain injury; Unsupervised machine learning; Phenotypes; Clinical outcomes; Emergency care (LMIC settings)

OR-AI-03

AI-Driven Tele-Mental Health Interventions for Trauma-Related Depression in Adults

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Background: Depression following traumatic experiences, including the loss of a loved one or other major stressors, is a significant public health concern affecting adults worldwide. Many individuals face barriers to accessing timely mental health support, such as limited services, social stigma, and a shortage of trained professionals. Artificial intelligence (AI) integrated into tele-mental health platforms provides a promising approach for early detection, ongoing support, and personalized care.

Objective: This study examines the effectiveness of AI-based tele-mental health interventions in reducing trauma-related depression among adults, using a combination of survey data, computational analysis, and platform evaluation.

Methods: One hundred and fifty adults experiencing trauma-related depressive symptoms completed standardized questionnaires measuring depression severity and grief. AI algorithms analyzed survey responses and participant interactions with a virtual therapy platform to identify high-risk individuals and predict treatment outcomes. Participants used the AI-enabled platform for six weeks, during which usability, engagement, and clinical outcomes were tracked using validated scales and platform logs.

Results: The AI system effectively identified participants at higher risk for severe depression and trauma-related distress. Engagement with the virtual therapy platform led to meaningful improvements, with 68% of participants showing significant reductions in depressive and grief-related scores. Participants reported high satisfaction and felt emotionally supported by the platform. The integrated approach of survey analysis, computational modeling, and platform evaluation enabled timely interventions and personalized recommendations, demonstrating AI's potential to enhance mental health outcomes for trauma-affected adults.

Conclusion: AI-enhanced tele-mental health interventions offer a scalable and effective approach for managing trauma-related depression in adults. By improving accessibility, personalization, and continuous monitoring, these tools complement traditional mental health care and can significantly improve patient outcomes.

KEYWORDS: Trauma-related depression; Artificial intelligence (AI); Tele-mental health; Virtual therapy platforms; Digital health; Mental health accessibility; Computational analysis; Digital health interventions

OR-AI-04

AI-Powered Surveillance for Early Detection of Vector-Borne and Zoonotic Disease Risks in Tanzania.

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Background: Vector-Borne and zoonotic diseases stand as major threats to both human, livestock and wildlife health in Tanzania. Some diseases like Malaria, Trypanosomiasis, Rift Valley fever still persist in our settings (residential, wildlife-livestock interaction and pastoral) but there is limited data due to limited surveillance. The ongoing monitoring system is highly manual, slow and easily succumbed by geographical attributes, thus delaying interventions and fuels economic and health burdens (WHO, 2025). This calls the urgent need for innovative, real-time, and scalable surveillance solutions as One Health is concerned.

Objective: To create a surveillance system powered with AI-glued sensors for Early and real-time detection of vector breeding habitats and notifiable zoonotic disease hotspots, favoring early enacting of interventions to safeguard human and animal health. This project provides Tanzania with an AI- driven platform system (first-of-its kind) attached with high resolution and thermal cameras, AI algorithms, and mobile and cloud-based dashboards.

Methods: The drones will be deployed in high-risk areas (livestock and wildlife) to collect potential environmental data (like potential vector habitats). AI models will be applied to scale out vector density, disease risk, and create immediate actionable maps. Also, local stakeholders will be summoned for validation and implementation of targeted interventions. Expected Impact: Reducing human and animal morbidity and mortality via as a result of early detection of vector activities and potential zoonotic infections, also providing a data-driven decision-making for veterinarians and public health experts.

Conclusion: Through the integration of unmanned aerial vehicles, artificial intelligence, and real-time environmental monitoring, this initiative transforms the landscape of vector and zoonotic disease surveillance in Tanzania. It presents a scalable, pragmatic, and groundbreaking solution that empowers local communities, informs public policy, and enhances One Health resilience (rendering it an attractive prospect for sponsorship and funding).

KEYWORDS: Artificial Intelligence; vector-borne disease; zoonotic disease; one health

Prognostic Modeling of the burden of 3rd-Generation Cephalosporin-Resistance in Gram-Negative Bacterial Bloodstream Infections Using Machine Learning at Bugando Medical Centre, Mwanza

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Background: The third-generation cephalosporin resistant Gram-negative bacteria (3GCephR-GNB) are classified as Critical WHO priority pathogens. Increasing 3GCephR-GNB causing blood stream infections (BSIs) is linked to adverse patients' outcomes. This study aimed at developing machine learning-based prognostic models using large sample size encompassing various patient populations to predict adverse outcomes and guide patients' risk stratification, management and improved patient care.

Methods: Patients meeting the diagnosis criteria of BSIs admitted to Bugando Medical Centre Tertiary Hospital (BMC) between 2022 and 2024 were included. Using R software, a 5-fold cross-validation was performed, and hyperparameter tuning was conducted at 2,4,6, and 8 sets of features. Receiver operating characteristic, sensitivity, specificity, and precision were used to assess and compare model appropriateness.

Results: A total of 3,869 admitted patients were included in the study, where 22.54% (872/3869) had a culture positive for GNB-BSIs, of which 82.80% (722/872) showed the 3GCephR. Approximately 42.10% had a prolonged hospital stay of more than 7 days with a median of 6 days (3-13 days), while 13.21% died. A logistic algorithm was developed with an AUC of 0.646 (0.627-0.669) and 0.892 (0.869-0.921), and a random forest with an AUC of 0.639 (0.624-0.659) and 0.899 (0.884-0.914) for predicting prolonged hospital stay and mortality, respectively. Variable of importance analysis revealed that waiver or out-of-pocket payment, elevated white blood cell count (WBC), multiple admissions, and the interaction between MDR and WBC were key variables in predicting mortality.

Conclusion: Prognostic models using logistic regression and random forest showed good discrimination for mortality, supporting their use in risk-stratification based on identified variable of importance, improved patient care, and efficient hospital resource allocation in efforts to reduce in-hospital deaths

Advancing Community-Based Primary Care Through Tablet-Based Electronic Clinical Decision Support: Evidence from the Dynamic Project, Mbeya and Morogoro, Tanzania

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Background: In low-resource primary healthcare settings, poor adherence to clinical guidelines often leads to diagnostic inaccuracies, excessive antibiotic use, and suboptimal patient outcomes. Electronic clinical decision support algorithms have shown benefits in pediatric care, but evidence on their scalability to routine primary care across all age groups remains limited. This study evaluated the impact of a tablet-based clinical decision support platform on quality of care and antibiotic prescribing in primary health facilities.

Methods: This implementation study was conducted from 2021 to 2024 across 40 primary health facilities in the Mbeya and Morogoro regions of Tanzania, using an intervention-versus-control design. A tablet-based platform was introduced to support clinicians during routine consultations. Clinicians without programming skills used a

visual interface to design step-by-step clinical guidelines, including structured questions, examination steps, checkpoints for critical symptoms, and decision rules. Implementation included two-day training, on-site support, and routine monitoring. Data on guideline adherence and antibiotic prescriptions were collected from consultation records and compared between intervention and control settings.

Results: The digital tool improved guideline adherence, increasing assessment of major clinical symptoms and signs from 23% in control facilities to 46% in intervention facilities ($p < 0.001$). Unnecessary antibiotic prescriptions decreased from 70% to 23%, while maintaining clinical safety and outcomes. Providers reported high acceptance due to the user-friendly, offline-capable, low-power design and built-in mentorship features. The platform was easily adaptable and extended beyond pediatric care to broader primary care populations.

Conclusion: Tablet-based clinical decision support platforms can strengthen community healthcare by improving adherence to guidelines and reducing inappropriate antibiotic use. Findings from this study demonstrate their potential to scale beyond pediatric use and support evidence-based care for patients of all ages in resource-limited primary care settings.

KEYWORDS: Tablet-based electronic clinical decision support algorithms; point-of-care diagnostics; improving decision-making

OR-DIG-02

Innovation and Intellectual Property Gender Gap and Associated Factors in Tanzania

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Background: A systematic reform to acknowledge and protect women's unregistered patent rights has been suggested as a strategy to close gender gap in innovation and patenting. In Tanzania, the magnitude of innovation and intellectual property (IP) gender gap have not been explored.

Objective: The purpose of the study was to generate evidence to inform strategies to increase use of IP systems and stimulate innovation culture.

Methods: This study reviewed national and institutional IP and gender frameworks to examine legal and political environment for women's participation in innovation. Secondary data from national IP office was analyzed to determine gendered patterns of inventorship. A total of 148 staff from research and academic institutions responded to self-administered structured questionnaire. In-depth interviews were conducted with 10 key informants to identify challenges in patenting. Secondary data from research and academic institutions were analyzed to examine gender gap.

Results: Gender mainstreaming is absent in institutional innovation and IP policies. Women share in research and academic job positions stand at 38.2% and 29.4% respectively. The share of women inventors remained at approximately 17% for the past five years. Challenges faced by women in research and academic institutions include limited access to IP education, financial resources, inclusive policies and legal support are challenges faced by women.

Conclusion: Women's patenting practice in Tanzania is limited and compounded by low IP awareness, and limited access to resources, legal support and inclusive policies. There is a need for provision of formal education on the patenting process, work-life balance, gender stereotypes and biases, and fostering mentorship opportunities for women and girls. Institutions should center equity when developing policies and programs, or when implementing institutions' operations.

KEYWORDS: Patenting; Gender; Innovation; Women; Intellectual Property; Tanzania

Co-Designing ParentApp for Kids Tanzania: Insights from Formative Workshop on Caregivers' Needs in Supporting Early Childhood Development

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Background: Caregivers play a key role in early childhood development. They interact with children daily and create a stimulating environment that supports learning and growth. In low and middle-income countries, many children face risk factors including poverty, malnutrition, poor health, and limited psychological stimulation that significantly hinder cognitive, emotional, social, and motor development. To support children better, it is important to understand caregivers' needs, especially when it comes to mental health and parenting support. This paper explores caregivers' perceptions of proposed program topics and support needs to inform the co-design of ParentApp for kids, a digital intervention designed to improve caregiver wellbeing and child development.

Methods: Using a participatory approach, we conducted a formative workshop with 20 caregivers of children aged 2 to 9 years. Data collection was conducted in March 2024 at the selected study site in Dar es Salaam. The focus group discussions were audio-recorded and later transcribed. NVivo 15 was used for coding, and later, a summary of themes was generated.

Results: Findings highlighted several key themes, including the impact of economic constraints on caregiver mental health, the importance of self-care and child wellbeing, child safety, and valued parenting practices. Other key themes that emerged included effective parenting strategies, such as play and shared reading, as well as additional content on nutrition and support for children with special needs.

Conclusion: These insights helped the app's design, content, and delivery strategy. This research contributes to the fields of digital parenting and early childhood development by demonstrating the value of co-design methodology in creating contextually relevant interventions that empower caregivers and promote children's well-being, while also providing a foundation for scaling up such interventions in diverse settings.

KEYWORDS: Caregiver mental health; early childhood development; child wellbeing; ParentApp for kids

East African Regional Centers of Excellence Telemedicine Readiness: An Assessment of Services, Human Resources, and Digital Assets

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Introduction: The East African region faces a healthcare crisis with unequal access, workforce shortages, rising costs, and limited infrastructure. Telemedicine is a promising solution, but its implementation is hindered by inadequate digital infrastructure, an untrained digital workforce, and regulatory gaps. This study assessed Digital Assets and Capacity for Telemedicine within the East African Regional Centres of Excellence (RCoEs) to provide actionable insights for advancing telemedicine.

Methods: A descriptive, qualitative study across six East African RCoEs were conducted from April to May 2025. Data were collected through document reviews, structured assessments using a specialised Telemedicine

Assessment Framework, observation, and semi-structured interviews with executive, Information Communication Technology (ICT) personnel healthcare, and supporting staff. Rigorous thematic analysis using ATLAS.ti identified key patterns, challenges, and capacities.

Results: The East African RCoEs demonstrated foundational digital infrastructure; however, readiness for advanced telemedicine remains limited by infrastructural, governance, and regulatory constraints. Major gaps included unreliable internet connectivity, absence of specialised telemedicine platforms, limited formal training in virtual care, weak data governance with minimal HL7/FHIR compliance, insufficient dedicated digital health funding, and lack of comprehensive telemedicine policies. Existing digital systems predominantly support academic and administrative functions rather than clinical service delivery. These gaps highlight a misalignment between available digital assets and clinical telemedicine requirements, underscoring the need for targeted infrastructure upgrades, interoperable systems, workforce capacity development, and strengthened policy frameworks.

Conclusion: East African RCoEs show telemedicine potential but are hindered by structural, infrastructural, and fragmented policy. Unlocking this requires a unified EAC Regional Telemedicine Policy and a robust, standards-aligned interoperability framework. These actions will empower RCoEs as digital health innovators, improving equitable and quality healthcare access and accelerating Universal Health Coverage (UHC).

KEYWORDS: Telemedicine; Digital Health; Telemedicine; Digital Assets; Interoperability; Regulatory Policy; Healthcare Access

OR-DIG-09

Need Assessment Report for Development of the National Research Ethics Information Management System (NREIMS)

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Background: The health research ethics review process is essential for protecting human participants. As the volume and complexity of clinical research increase, optimal performance of Research Ethics Committees (RECs) becomes critical. Digitalization and harmonization of ethics review processes are increasingly recognized as key strategies to improve efficiency, transparency, and quality. In this context, the Consortium for Clinical Research Regulation and Ethics Capacity in Eastern Africa (CCRREEA) conducted a needs assessment to inform the development of an integrated National Research Ethics Information Management System (NREIMS) in Tanzania.

Objectives: This study aimed to assess ethics clearance processes among RECs, evaluate existing electronic systems, identify operational challenges, and provide recommendations for the development of an integrated NREIMS.

Methodology: A cross-sectional mixed-methods study was conducted in 2021. Quantitative data were collected using self-administered surveys from 15 institutions, including 12 RECs and 3 National Regulatory Authorities (NRAs). Qualitative data were obtained through in-depth interviews with 8 purposively selected clinical trial researchers. Quantitative data were analyzed using descriptive statistics in SPSS version 20, while qualitative data were analyzed thematically using NVivo 12.

Results: All targeted institutions participated. Findings showed that most RECs were partially digitalized, with four operating fully functional web-based systems. Three RECs could not confirm their accreditation status, eight conducted active research oversight. Ethics review timelines were often prolonged, ranging from six weeks to six months. Three key themes emerged: inefficiencies and delays in review processes; variability in system usability and digital infrastructure; and a strong need for system integration and user training. Participants consistently emphasized the importance of a unified, user-friendly digital platform.

Conclusion: There is an urgent need for a harmonized, centralized digital system to improve ethics review processes in Tanzania. The proposed NREIMS offers a one-stop platform to enhance coordination, efficiency, and regulatory oversight across RECs and NRAs.

KEYWORDS: Research Ethics Committee; Institutional Review Board; National Research Information Management System; Research Oversight; clinical trials.

OR-DIG-11

AI-Enabled Predictive Analytics Using Routine Health Information System Data to Strengthen Malaria Surveillance and Health System Resilience in Tanzania

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Background: Malaria remains a leading cause of morbidity and mortality in Tanzania and continues to strain health system resources, particularly in rural and high-transmission regions. Although routine Health Information Systems (HIS) collect extensive district-level surveillance data, current analytical practices are largely retrospective and descriptive, limiting early detection of abnormal incidence patterns and proactive intervention.

Objectives: This study aims to develop an AI-enabled predictive framework for district-level malaria risk stratification using routine HIS data, with the goal of strengthening early warning systems, improving resource allocation, and enhancing health system resilience in support of Universal Health Coverage.

Methods: The study proposes a supervised multi-class classification framework that integrates routine HIS data with climatic and environmental indicators. Key features include temporal incidence trends, spatial risk factors, and climate variability variables derived from NASA and WHO datasets. ML models, including Random Forest and Long Short-Term Memory (LSTM) networks, will be trained and evaluated using cross-validation techniques. Performance will be assessed using accuracy, precision, recall, F1-score, confusion matrix, and area under the ROC curve to ensure predictive robustness.
Results/Outputs: The proposed framework is expected to accurately classify districts into malaria risk categories (e.g., low, moderate, high, and outbreak risk) and provide timely early warning signals for potential disease surges. The system is anticipated to improve detection of emerging risk patterns, enhance decision-making for resource allocation, and support proactive intervention planning at district and national levels.
Conclusion/Impact: By transforming routine health data into predictive intelligence, this study offers a scalable and data-driven approach to strengthen outbreak preparedness, optimize resource utilization, and enhance district-level response capacity. The proposed framework contributes to building resilient, data-driven health systems and supports Tanzania’s progress toward Universal Health Coverage and the Development Vision 2050. **Keywords:** Artificial Intelligence (AI), Health Information Systems (HIS), Machine Learning, Universal Health Coverage (UHC), Tanzania’s Development Vision 2050

OR-INJ-02

Evaluation of the Psychometric Properties of the Patient Specific Functional Scale for the Pediatric injury patients at a Zonal referral hospital in Northern Tanzania.

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Background: Injuries significantly impact illness and death among children in low- and middle-income countries like Tanzania. The Patient-Specific Functional Scale (PSFS) is widely used to measure recovery, but its effectiveness for pediatric injury patients in these settings is not well established. This study evaluates how valid and reliable the PSFS is for assessing functional recovery in injured children at a referral hospital in Northern Tanzania.

Methods: This retrospective cohort study analyzed pediatric injury registry data (November 2020–June 2024) from Kilimanjaro Christian Medical Centre in Northern Tanzania. Pediatric patients treated in the emergency department were assessed for in-hospital mortality and morbidity, with follow-up at two weeks and three months post-discharge. Functional outcomes were measured using the PSFS and GOS-E Ped. Reliability was evaluated with Cronbach's alpha, MCID was determined using distribution- and anchor-based methods, and Spearman's correlation assessed the relationship between the scales.

Results: Among 1,000 pediatric injury patients, the mortality rate was 6.6%. PSFS mean scores improved from 4.3 at hospital discharge to 6.5 at two weeks post-discharge from the hospital, and 9.0 after three months. The PSFS showed good reliability (Cronbach's alpha: 0.90). A moderate negative correlation was observed between PSFS and GOS-E Ped at three months (Spearman's ρ : -0.74). The optimal cut off point of MCID was determined to be 2.7, with a sensitivity of 0.73, specificity of 0.72, and an area under the curve (AUC) of 0.83.

Conclusion: The PSFS proved to be a valid, reliable and responsive outcome measure for assessing functional changes in pediatric injury patients, with strong internal consistency. The findings support using the PSFS to measure morbidity in pediatric injury patients in our setting.

KEYWORDS: Evaluation; PSFS; Pediatric Injury; Zonal Referral Hospital; Northern Tanzania

OR-NCD-02

Sensitivity Analysis of Mobile Phone Surveys Using Computer-Assisted Telephone Interviews (Phases I and II) on Key WHO STEPS Non-Communicable Disease Indicators in Tanzania

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Introduction: Rising mobile phone use enables timely, cost-effective data collection, complementing infrequent household surveys and enhancing monitoring through mobile-based approaches. However, local evidence on the comparability of mobile phone surveys with traditional survey methods remains limited.

Objective: To assess the comparability of mobile phone-based Computer-Assisted Telephone Interview (CATI) surveys (Phases 1 and 2) with the World Health Organization (WHO) STEPS Survey in estimating key non-communicable disease indicators in Tanzania.

Methods: Data were drawn from the WHO STEPS cross-sectional survey (2023; $n=3,565$) and two CATI surveys conducted in 2024 (Phase 1: $n=4,479$; Phase 2: $n=1,828$) among adults aged 18–69 years. Phase 2 included respondents from the 2023 STEPS survey who consented to telephone follow-up. Chi-square tests compared prevalence estimates across surveys. Adjusted differences were assessed using linear regression for continuous

variables and logistic and modified Poisson regression for binary outcomes.

Results: Adjusted analysis comparing the 2023 STEPS survey with the 2024 CATI Phase 1 survey showed no statistically significant differences across several key indicators, including former smokers, current daily smokers, ever tobacco smokers, former daily smokers, current and former smokeless tobacco users, current daily smokeless tobacco use, ever and ever daily smokeless tobacco use, diagnosis of raised blood pressure, current use of antihypertensive medication, diagnosis of raised blood sugar, current use of diabetes medication, and non-consumption of fruits and vegetables. Similar patterns were observed when comparing CATI Phase 1 and Phase 2. However, significant differences were identified for some indicators, suggesting variability in estimates across survey modalities.

Conclusion: The findings indicate that estimates from the Mobile Phone Survey are comparable to those from the World Health Organization STEPS Survey for several indicators, although variability across others underscores the need for cautious interpretation and further validation of survey modalities.

KEYWORDS: Mobile phone surveys; World Health Organization STEPS survey; noncommunicable disease risk factor indicators.

PO-DIG-02

Automated Transfer of GeneXpert 10-Color Module Results to Electronic Tuberculosis Register (ETL) through Adapter-Enabled Autofill

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Background: Recent advances in rapid molecular diagnostics, including the 10-color module GeneXpert platform, have expanded access to drug-resistant tuberculosis (DR-TB) testing. For operational feasibility, testing is often centralized, leading to prolonged turnaround times (TAT) delaying clinical decision-making and limiting timely patient benefit. The Tanzania National Tuberculosis Program (NTLP) relies on manual entry of laboratory results into the Electronic TB Register (ETL), further contributing to inefficiencies. We evaluated the effectiveness of an automated electronic linkage between Xpert XDR platforms and the ETL system.

Methods: An interfacing adapter was developed through extensive stakeholder engagement, enabling identification and integration of essential data variables. Laboratory personnel from three zonal laboratories were trained on the use of the system, including automated result synchronization. For connectivity, all sites were supported with monthly internet bundles and technical support for rapid troubleshooting. A pre-post analysis was conducted to evaluate the impact of this integration on TAT of results.

Results: From September 2021 to August 2022 (pre-implementation), only 20 samples were tested for molecular drug susceptibility testing using the 10-color module GeneXpert platform. This increased substantially to 175 samples tested between September 2022 and October 2023, during and following project implementation. The median TAT before the project was 31 days (IQR 19 - 83). This was reduced to a median of 17 days (IQR 15 - 17) during the implementation of this synchronization, p-value (0.0001).

Conclusion: The integration of an interfacing adapter with the 10 color module Xpert platform was feasible and greatly reduced the TAT of results for clinical decision making. These findings demonstrate the potential to optimize the use of advanced diagnostic platforms through automated linkage with electronic data capture systems.

KEYWORDS: Drug-resistant tuberculosis; Electronic TB registry; Xpert XDR assay

Analysis of collections in Amani library as a basis for digitization

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Background: Community libraries in Tanzania play a vital role in supporting education, research, and lifelong learning. Analyzing Amani community library will serve as a basis for digitization, because digitization presents an opportunity to transform these libraries into modern knowledge hubs that can better serve community needs. However, Amani library collections are not accessible in digital format and the most valuable collection were not recorded. The objective of this study is to assess the types and value of library collection available in the Amani library as a basis for digitization.

Methodology: Observation and quantitative methods were used to assess the type and value of library collection. Library collection were divided in to five categories; from 1901-1920, 1921-1950, 1951-1960, 1961-1979, 1980-2026. Archival maps were categories into their own categories. Books were recorded into a spread sheet for analysis.

Results: Amani library has a total of 3,684 and categorized as follows: 1901-1920 (3.47%), 1921-1950(15.09%), 1951-1960 (14.5%), 1961-1979(47%), 1980-2026 (19.97%). The most important collections are from 1902 to 1960 which are rarely available in any other libraries. Beside book collection, our library contains 215 archival maps dating form 1902, representing various counties and towns in Africa.

Conclusion: The study concludes that Amani community library contains books and maps that cannot be found anywhere. We recommend all collection to be digitized for easy accessibility of researchers throughout the world.

KEYWORDS: Amani library; Digitization

AI-Powered Early Detection of Breast Cancer in African Women using Mammogram Analysis

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Background: Breast cancer is the most common cancer among women in Africa and contributes substantially to cancer-related mortality due to late-stage diagnosis. Over 70% of breast cancer cases in many African settings are detected at advanced stages due to limited screening infrastructure, shortages of radiologists, and socio-economic barriers. Artificial intelligence (AI) has the potential to assist clinicians by supporting early detection and diagnostic decision-making. This study aimed to develop and evaluate an AI-based framework (MAM-AFRICA) for automated breast cancer detection and risk assessment using mammogram images.

Methods: A multi-task deep learning framework combining Convolutional Neural Networks (CNN) and Transformer layers was developed to analyze BI-RADS-labeled mammogram images (n = 1,991). Images were preprocessed through resizing (224×224 pixels), normalization, contrast enhancement, and data augmentation to improve model generalization. A hybrid ResNet50-Transformer architecture extracted spatial features and supported multiple diagnostic branches for cancer detection, staging, and risk assessment. Model interpretability was enhanced using Gradient-weighted Class Activation Mapping (Grad-CAM) heatmaps. Performance was evaluated using accuracy, sensitivity, specificity, and diagnostic classification patterns.

Results: The proposed model achieved 96% accuracy for risk assessment and 97% accuracy for cancer detection tasks. Sensitivity for detecting suspicious or malignant cases (BI-RADS 4-5) was 76%, while specificity for normal cases (BI-RADS 1) was approximately 100%, indicating strong ability to identify non-cancer cases. However, the model demonstrated limited sensitivity for BI-RADS 5 cases, highlighting a key limitation in detecting highly

malignant tumors. Grad-CAM visualizations identified relevant regions within mammograms, providing interpretable outputs for clinical review.

Conclusion: The results demonstrate the potential of AI-based tools to support mammogram interpretation in resource-limited settings. While the model showed strong specificity and overall classification performance, improvements are needed to enhance sensitivity for highly malignant cases. Future work should involve larger datasets and model refinement to improve detection performance and clinical reliability.

Communicable Diseases and Antimicrobial Resistance

140 Abstract(s)

OR-AMR-01

Prevalence of Antimicrobial Resistance in Tanzania: A Systematic Review and Meta-Analysis

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Background: Despite the urgency of resistant pathogens, systematic reviews focusing specifically on Tanzania are limited, and while several studies report resistance patterns for individual pathogens, a consolidated analysis of overall prevalence is needed to inform policymaking and public health interventions. The study assessed the prevalence of antimicrobial resistance among clinically relevant pathogens in Tanzania, to support surveillance, infection control, and stewardship efforts.

Methods: A total of 1865 studies identified from Google Scholar (1600), PubMed (13), and Science Direct (252) underwent screening and full article review. Finally, 28 studies were included. A subgroup analysis was performed to evaluate the resistance patterns within antibiotic classes for specific pathogens.

Results: Most isolates (25.0%) were obtained from urine samples. Of these studies, 75% were cross-sectional studies and 92.9% were conducted in hospital settings. There was high resistance to penicillin, particularly amoxicillin-clavulanic and ampicillin, with *Klebsiella pneumoniae* (0.96 [0.83–0.99]), *Acinetobacter baumannii* (0.94 [0.67–0.99]) and *Escherichia coli* (0.90 [0.81–0.95]). Similarly, erythromycin resistance was most prevalent in *Campylobacter* spp. (0.85 [0.80–0.89]). Ciprofloxacin resistance was highest in *Acinetobacter baumannii* (0.54 [0.33–0.73]), whereas amikacin resistance was highest in *Proteus* spp. (0.86 [0.35–0.99]). Ceftriaxone resistance was particularly high in *Acinetobacter baumannii* (0.91 [0.70–0.98]) and *Pseudomonas aeruginosa* (0.85 [0.74–0.92]). Meropenem resistance was lowest among *Escherichia coli* (0.04 [0.01–0.10]) and *Klebsiella* spp. (0.07 [0.03–0.15]), while the pooled resistance across ESKAPE-E pathogens was (0.11 [0.06–0.19]). Imipenem and clindamycin each had an overall pooled resistance of (0.06 [0.02–0.14]) against both *Escherichia coli* and *Klebsiella pneumoniae*.

Conclusion: Findings highlight widespread resistance among bacterial pathogens, ESKAPE-E, particularly in the Access and Watch groups of antibiotics. Variability in resistance patterns underscores need for Ministry of Health to re-evaluate empirical treatment protocols (STG/NEMLIT) ensuring effective treatment regimens, strengthen antimicrobial stewardship, enhance surveillance systems, and rational antibiotic use.

KEYWORDS: Antimicrobial resistance; ESKAPE-E; AWaRe; Tanzania

OR-AMR-02

Clinicians' Awareness and Clinical Practices Related to Antimicrobial Resistance: A cross-sectional study at Muhimbili National Hospital, Tanzania

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Background: Antimicrobial resistance (AMR) is a major global public health threat, disproportionately affecting low- and middle-income countries due to limited diagnostic capacity and weak antimicrobial stewardship. Clinicians play a central role in antimicrobial prescribing and resistance containment. This study assessed clinicians' knowledge, attitudes, and prescribing practices related to AMR in Tanzania.

Methods: A hospital-based mixed-methods cross-sectional study was conducted among clinicians at MNH. Quantitative data were collected from 154 clinicians using a structured questionnaire assessing AMR knowledge, attitudes, and prescribing practices. Qualitative data were obtained through a focus group discussion and in-depth interviews to explore contextual and behavioural factors influencing prescribing decisions. Quantitative data were analysed descriptively using SPSS version 25, while qualitative data were analysed thematically.

Results: 93% of clinicians demonstrated good knowledge of AMR. Most recognised the importance of culture and sensitivity testing before initiating antibiotic therapy (95.5%). However, notable knowledge gaps were identified, including misconceptions that more expensive antibiotics are more effective (48.1%) and uncertainty on reversibility of antimicrobial resistance. Attitudes toward AMR control were largely positive, with most clinicians recognising the role of correct antibiotic use in reducing resistance (96.1%) and acknowledging poor hand hygiene as a contributor to AMR (89.6%). Clinicians also expressed a strong preference for locally tailored treatment guidelines. Prescribing practices aligned with stewardship principles, with most clinicians opposing unnecessary use of broad-spectrum antibiotics (64.3%) and rejecting the notion that limiting antibiotic use compromises patient care (77.3%). Nonetheless, empirical prescribing driven by delayed laboratory results, patient expectations, and institutional antibiotic approval processes remained common.

Conclusion: Clinicians demonstrated high AMR knowledge and positive attitudes toward antimicrobial stewardship. However, persistent misconceptions, diagnostic limitations, and system-level barriers continue to influence prescribing practices. Strengthening AMR control requires context-specific training, improved diagnostic capacity, behavioural change interventions, and institutional reforms to support consistent implementation of antimicrobial stewardship principles.

KEYWORDS: Antimicrobial Resistance; Knowledge; Attitude; Tanzania

OR-AMR-03

Molecular Epidemiology and Antimicrobial Resistance of Extended-Spectrum Beta-Lactamase-producing *Enterobacter Cloacae* Complex in Obstetric and Neonatal Units in Tanga, Tanzania

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Background: *Enterobacter cloacae* complex (ECC) comprises several related *Enterobacter* species, with *E. hormaechei* being the most prevalent in clinical settings. ECC have emerged as an important cause of healthcare-associated infections worldwide. Treatment of ECC infections is challenging due to intrinsic resistance mediated by inducible AmpC beta-lactamases and the frequent acquisition of extended-spectrum beta-lactamase genes. This study aimed at characterizing the molecular epidemiology and antimicrobial resistance profiles of ESBL-producing ECC isolates collected from two hospitals in Tanga.

Methods: A cross-sectional survey was conducted between May 2022 and March 2023, swabs were collected from neonates, mothers, healthcare workers' hands, and the hospital environment, isolates were identified using the Chromogenic agar, API 20 E and Vitek 2. Antimicrobial susceptibility testing was performed according to the EUCAST guidelines. Whole-genome analysis was performed to determine sequence types (STs), resistance genes,

virulence genes and plasmid replicons. Phylogenetic relatedness among isolates recovered from different sources was assessed to detect potential transmission pathways.

Results: A total of 132 ECC isolates were recovered, with environmental samples (65.90%, n/N = 87/132) yielding more isolates than human sources (34.10%, n/N = 45/132). ECC colonization was detected in 4.2% of neonates, of whom 52.9% acquired colonization during hospitalization, suggesting nosocomial transmission. Multidrug resistance (MDR) was prevalent (73.4%). Genomic analysis identified five species, predominantly *E. hormaechei* (93.3%), followed by *E. cloacae* (4.2%). A high diversity of beta-lactamase genes was detected, dominated by blaCTX-M-15 (88%) and blaACT genes (94%), alongside carbapenemase genes blaNDM-1 and blaNDM-5 (12.1%). Notably, colistin resistance gene mcr-10.1 was exclusively associated with ST66 isolates, ST346 was the most dominant sequence type (24.2%), circulating across human and environmental samples.

Conclusion: The co-occurrence of MDR and virulence factors underscores the enhanced potential for invasive infections. This study emphasizes the critical need for rigorous environmental hygiene measures and enhanced infection prevention and control strategies.

KEYWORDS: Enterobacter cloacae complex; Healthcare-associated infections; Multidrug resistance; Mothers; Neonates

OR-AMR-04

Determining Knowledge, Attitudes and Practices on Anti-Microbial Resistance among Patients attending Referral Hospitals in Dodoma Region

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Background: Antimicrobial drugs are vital for the prevention and treatment of microbial infections in humans but irrational use of these drugs, however, can cause the emergence of antimicrobial resistance in both target pathogens and other normal flora and this condition recently increased globally. The study aims to explore knowledge, attitude and practices towards antimicrobial resistance among patients attending referral hospitals in Dodoma region.

Methodology: This was a cross-sectional study among patients attended referral hospitals in Dodoma region from May to June 2025. Systematic random sampling was used to select respondents. A semi-structured questionnaire used to collect socio-demographic information and knowledge, attitudes, and practices (KAP) on AMR. Data was analyzed using Statistical Package for the Social Sciences version 22.0.

Results: The study involved 407 participants from referral hospitals in Dodoma region. The study found that, about 264 (64.9%) of the participants demonstrated good knowledge of antimicrobial resistance. Concerning attitudes, it was observed that, higher proportion (350) 86% of the study participants exhibited a good attitude towards antimicrobial resistance and 57 (14%) had poor attitude toward antimicrobial resistance.

Conclusion: A significant proportion of the participants demonstrated good knowledge of antimicrobial resistance, studied participants exhibited a good attitude towards antimicrobial resistance and 57 (14%) had poor attitude towards antimicrobial resistance. The responsible organs, non-government institutions and health stakeholders should take part in ensuring antimicrobial resistance can be prevented and continuing education should be provided to the community regarding impacts, preventions, attitudes and practices regarding antimicrobial resistance.

KEYWORDS: Antimicrobial resistance; Knowledge; Attitudes and practices; Dodoma region; Patients; Referral hospitals

Optimization of a LC-MS/MS method for simultaneous determination of multiclass antimicrobial residues in wastewater: A case study of Kilimanjaro and Mwanza, Tanzania

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Introduction: Antimicrobial resistance (AMR) is a growing public health threat in Tanzania, requiring a “One Health” approach that integrates human, animal and environmental aspects. The discharge and gradual accumulation of antimicrobial residues are major drivers to the evolution of multidrug resistant superbugs to the natural environment.

Methods: To effectively monitor these contaminants, this study presents an optimized analytical method capable of the simultaneous determination of 14 antibiotics residues across 10 distinct chemical classes. Unlike other methods, this approach harmonizes the extraction and quantification of chemically diverse compounds including those challenging analytes like meropenem and polymyxin B. The successful application of this method in evaluation of seasonal and regional variations across different geographical areas provide a robust blueprint for comprehensive, cost-effective, and environmental surveillance of antimicrobial resistance (AMR) pioneers.

Results: The correlation coefficient (R²) of the antimicrobial was above 0.98 with the relative standard deviations (%RSD) < 15%. The limits of detection and quantification ranged from 0.00052 µg/mL to 0.18164 µg/mL and 0.00158 µg/mL to 0.55044 µg/mL, respectively. Recoveries for 14 antibiotics were within the acceptable range (80% - 120%) except for gentamicin (59.8%), polymyxin B (79%), ceftriaxone (57.9%) and florfenicol (68.1%). The method was used to determine the antibiotic residues in municipal wastewater (MWW).

Conclusion: Nearly all detected antibiotics exceeded Predicted No Effect Concentration (PNEC) values (RQ > 1), highlighting a critical environmental threat, yet underutilized component of diseases prevention. By sharing the data with health local authorities and community leaders we can drive targeted engagement strategies to improve antibiotics stewardship and waste management. Also, regular environmental pollution monitoring and implementation of antimicrobial residue surveillance programs are significant in addressing the global challenge of antimicrobial resistance.

KEYWORDS: antibiotic residues; LC-MSMS; antimicrobial resistance

Genomic Characteristics of ESBL-Producing *Escherichia coli* and *Klebsiella pneumoniae* Isolated During and After the Implementation of National Action Plan on Antimicrobial Resistance in Mwanza, Tanzania

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Background: Extended-spectrum beta-lactamase-producing *Escherichia coli* (ESBL-EC) and *Klebsiella pneumoniae* (ESBL-KP) pose significant clinical challenges. The implementation of National Action Plan on Antimicrobial Resistance (NAP-AMR) in Tanzania is largely focused on phenotypic characterization of pathogens. This study determined genomic diversity and clonal relationships of ESBL-EC and ESBL-KP isolated during and

after the NAP-AMR implementation in Mwanza, Tanzania.

Methods: This cross-sectional study employed whole genome sequencing to characterize ESBL-EC (n=39) and ESBL-KP (n=49) isolated from patients with bloodstream, urinary tract, and wound infections at a zonal referral hospital between June 2019–June 2020 (during NAP-AMR) and March–August 2023 (after NAP-AMR).

Results: Predominantly, ESBL-EC changed from ST648 (42.8%) during NAP-AMR to ST131 (33.3%) after NAP-AMR, while ESBL-KP changed from ST280 (26.1%) during NAP-AMR to ST2390 (46.1%) after NAP-AMR. Serotype patterns also reflected these clonal changes with ESBL-EC serotype O102:H6 exclusively confined during NAP-AMR (33.3% vs. 0%, $p=0.008$), compared to O25:H4 predominant after NAP-AMR. The ESBL-KP showed temporal exclusivity with O2afg:K23 during NAP-AMR (27.3% vs. 0%, $p=0.021$) and O1ab:K16 after NAP-AMR (0% vs. 52.2%, $p<0.001$). The blaCTX-M-15 was the primary gene encoding ESBL production (87.2% ESBL-EC and 95.9% ESBL-KP). The cgMLST-based phylogenetic analysis revealed substantial genetic diversity with clonal transmission events, particularly involving high-risk clones, ST131 and ST2390.

Conclusion: This study highlights clonal transmission events, the first report of ESBL-KP ST2390 clone, and the persistence of the virulent high-risk clone ESBL-EC ST131 after NAP-AMR in Mwanza, Tanzania. These findings underscore the critical need for reinforced infection control strategies and ongoing genomic surveillance.

KEYWORDS: Bacterial genomic evolution; clonal diversity; Escherichia coli; extended-spectrum beta-lactamase; Klebsiella pneumoniae; whole genome sequencing.

OR-AMR-07

Antimicrobial resistance patterns of isolated bacteria at Bukoba Regional Referral Hospital in Patients attended from 2019 to 2023

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Background: Antimicrobial resistance (AMR) has emerged as a global public health concern, increasing morbidity, mortality, and healthcare costs. Limited surveillance data exist from regional referral hospitals in Tanzania, including Bukoba Regional Referral Hospital (BRRH). Understanding local AMR patterns is essential to guide empirical therapy and inform infection prevention and control strategies.

Objective: This study aimed to determine the patterns, trends, and factors associated with AMR among bacterial isolates at Bukoba Regional Referral Hospital (BRRH) between 2019 and 2023.

Methodology: A cross-sectional study analyzed 1,680 clinical specimens processed at Bukoba Regional Referral Hospital (Bukoba RRH), of which 297 (17.7%) yielded positive cultures. Data were extracted from Afyacare, GoTHOMIS, and laboratory registers. Descriptive and inferential analyses were performed to assess resistance profiles, multi-drug resistance (MDR), and alignment between susceptibility patterns and prescribed antibiotics.

Results: The median age of patients was 28 years, with 58% female. Urine 110 (36.9%), pus 99 (33.2%), and stool 76 (25.5%) were the most common samples. Escherichia coli, Staphylococcus aureus, and Salmonella typhi were the predominant isolates. E. coli showed high resistance to azithromycin (95.0%) and ampicillin (84.4%); S. aureus and coagulase-negative staphylococci exhibited 100% and 90% resistance to penicillin, respectively.

Carbapenems and nitrofurantoin remained effective against several resistant strains. MDR was frequent, and 17.4% of patients were not prescribed antibiotics despite culture positivity, while mismatches between susceptibility results and prescriptions were common.

Conclusion: High levels of resistance to commonly used antibiotics on Azithromycin 60 (88.2%), Ceftriaxone 118 (84.3%) and Ampicillin 82 (83.7%), and widespread MDR highlight serious challenges in managing bacterial infections at Bukoba Regional Referral Hospital. Routine development of local antibiograms, strengthening antimicrobial stewardship programs, promoting rational antibiotic prescribing and enhancing infection prevention and control practices are urgently needed to combat AMR at BRRH and similar settings.

OR-AMR-08

Multidrug-Resistant Bacteria contamination on Highly Touched Surfaces among the Public Transports in Tanga City, North-Eastern Tanzania

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Abstract

Background: Public transportation including town buses, play a major role in the spread of multidrug-resistant (MDR) bacteria. MDR bacteria isolated from clinical environment of Tanga Regional Referral Hospital (TRRH) can spread to the community through public transport particularly town buses. There is limited information from Tanga and Tanzania in general on MDR-bacterial contamination from public town bus surfaces.

Objective: To determine the prevalence, antibiotic resistance pattern of MDR bacteria including MRSA, and ESBL- *E. coli*, ESBL- *K. pneumoniae*, ESBL-*Enterobacter* spp., MDR-*A. baumannii* and MDR-*P. aeruginosa* from highly touched surfaces of public town buses and compare the level of contamination with MDR bacteria among the town buses serving the hospital route versus non-hospital (community) route.

Methods: A cross-sectional study was carried out in Tanga city, north-east Tanzania from June 2024 to August, 2024 that involved sampling of highly touched surfaces among 70 public town buses using simple random sampling.

Results: Out of 482 swabs that were collected 61/482 (12.7%) were positive for MDR bacteria. Overall positivity rate of MRSA, ESBL-*Enterobacter* spp., ESBL- *E. coli*, ESBL-*K. pneumoniae*, MDR- *A. baumannii*, and MDR-*P. aeruginosa* were 28 (5.8%), 14(2.9%), 10 (2.1%), 5 (1.0%), 3(0.6%) and 1(0.2%), respectively. Among the public town buses, the most contaminated highly-touched surfaces were seats 22 (4.6%) and grab rails 10 (2.2%). The hospital route had higher MDR contamination than non-hospital route 39 (16.5%) vs 22 (9%), $P=0.012$.

Conclusion: Our study revealed that public transports were contaminated with MDR bacteria. The hospital routes had high MDR bacteria contamination compared to non-hospital route, and the most contaminated highly touched surface of town buses were the seats. Hospital visitors should always practice handwashing and applying sanitizers before boarding and disembarking from the public town buses. Key words: Multidrug-resistance, Public Transports, Highly -touched surfaces, Methicillin resistant *S. aureus*, ESBL-enterobacterales

OR-AMR-10

Hidden Reservoirs of Artemisinin Partial Resistance Markers in Tanzania: A surveillance of Asymptomatic Malaria Cases

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Background: Asymptomatic *Plasmodium falciparum* infections act as hidden reservoirs that sustain malaria transmission and may contribute to the spread of drug-resistant parasites. However, their role in harbouring markers of partial artemisinin resistance in Tanzania remains insufficiently characterized.

Objective: To determine the prevalence and distribution of molecular markers associated with partial artemisinin and partner drug resistance among asymptomatic *P. falciparum* infections across different transmission settings in Tanzania.

Methods: A community-based cross-sectional study was conducted from December 2022 to July 2023 in 12 villages across high- (Kigoma, Geita) and low-transmission (Arusha) regions. A total of 3,489 asymptomatic individuals (no fever or malaria symptoms, assessed using a structured questionnaire) were enrolled. Blood samples were analysed using rapid diagnostic tests, microscopy, and quantitative PCR (qPCR). All qPCR-positive samples (n=915) were selected for molecular analysis. The *pfk13* and *pfmdr1* genes were amplified and sequenced using Sanger sequencing. SNPs and haplotypes were analysed using appropriate statistical methods.

Results: Malaria prevalence by qPCR was 26.2% (915/3,489), significantly higher in high-transmission areas ($p < 0.001$). Of the positive samples, 834 (*pfk13*) and 804 (*pfmdr1*) were successfully sequenced, with 802 isolates fully analysed. Most isolates (95.2%) carried wild-type *pfk13*, while 2.8% harboured validated mutations associated with partial artemisinin resistance, including R561H (1.8%), A675V (0.7%), and Y493H (0.2%), detected only in high-transmission settings. The *pfmdr1* Y184F mutation was common (47.9%), whereas D1246Y was rare ($\leq 1.0\%$). Mutations were more frequent among younger children and females, though differences were not consistently statistically significant.

Conclusion: Asymptomatic *P. falciparum* infections in Tanzania harbour markers of partial artemisinin and partner drug resistance, particularly in high-transmission settings. Targeted surveillance of asymptomatic carriers is essential to mitigate the spread of resistant parasites and support malaria elimination efforts.

KEYWORDS: *Plasmodium falciparum*; *pfk13*; *pfmdr1*; asymptomatic malaria; ART-R markers

OR-AMR-11

Antimicrobial Resistance patterns in Gram-Negative Bacterial Pneumonia from Routine Hospital Data: Stewardship Implications in Northern Tanzania

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Background: Pneumonia remains a major cause of morbidity and mortality globally. Yet, empirical antibiotic regimens are largely based on Global North data. This study determined bacterial distribution and antimicrobial susceptibility, stratified by hospitalization status, prior antibiotic use, and comorbidities to inform antimicrobial stewardship in pneumonia.

Methods: This retrospective study analyzed routine antimicrobial resistance surveillance data from January 2024 to June 2025 in adults (with pneumonia at Kibong'oto Infectious Diseases Hospital, Tanzania.

Results: Out of 641 individuals presenting with cough, 259 (40.4%) had bacterial pneumonia. Of these, 243 had gram-negative and 16 gram-positive bacterial infections. Among 243 individuals, 174 (71.6%) were male, with a

mean age of 53.2 years (SD 17.0). Overall, 161 (66.3%) were outpatients, 8 (4.5%) were living with HIV, 148 (60.9%) had comorbidities, and 167 (67.9%) reported prior empirical antibiotic use. In total, 115 (47.3%) and 79 (32.5%) of 243 patients had respectively *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* pneumonia. *K. pneumoniae* was detected in 39/82 (47.6%) inpatients vs 76/161 (47.2%) outpatients ($p < 0.001$) whereas *P. aeruginosa* was found in 25/82 (30.5%) vs 54/161 (33.5%) respectively ($p = 0.737$). Bacterial detection did not differ by comorbidity status or prior antibiotic use ($p \geq 0.503$). *K. pneumoniae* and *P. aeruginosa* were susceptible to meropenem at 89.6% and 83.3%, piperacillin-tazobactam at 92.7% and 90.3%, and ciprofloxacin at 91.9% and 91.8%, respectively.

Conclusion: *K. pneumoniae* and *P. aeruginosa* predominated in bacterial pneumonia and were highly susceptible to ciprofloxacin, piperacillin-tazobactam, and meropenem, supporting routine AMR surveillance to inform antibiograms and antimicrobial stewardship programs.

KEYWORDS: Antimicrobial stewardship; antimicrobial susceptibility; Gram-negative bacterial pneumonia

OR-AMR-12

Distribution of Antimicrobial Resistance Genes in Acute Respiratory Pathogens in Tanzania: a Genomic Surveillance Study

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Background: Antimicrobial resistance (AMR) threatens the effective treatment of respiratory infections globally. In Tanzania, frequent empirical use of antibiotics such as tetracyclines, sulfonamides, and macrolides promotes the emergence and spread of antimicrobial resistance genes (ARGs). Next-generation sequencing (NGS) enables culture-independent surveillance of clinical samples, allowing comprehensive detection of pathogens and associated resistance determinants to inform treatment guidelines and antimicrobial stewardship.

Methods: This cross-sectional genomic surveillance study analyzed respiratory swab specimens collected between October 2023 and September 2024 through the national Influenza-like Illness (ILI) and Severe Acute Respiratory Infection (SARI) sentinel surveillance system in Tanzania. Stratified sampling ensured representation across five geographic zones. Nucleic acids were extracted using the Qiagen AllPrep kit and sequenced on the Illumina MiSeq platform. Explify bioinformatics pipelines were used to identify respiratory pathogens and antimicrobial resistance genes.

Results: Among 484 participants, 398 (82.23%) samples met sequencing quality criteria for analysis. The median age varied across zones, with the Central zone having the youngest population and the Lake Zone the oldest. Overall, 81.3% were aged ≥ 5 years, 18.7% were under five years, and females represented 52.1% of participants. Most individuals had no reported comorbidities (80.2%). Genomic analysis revealed a high prevalence of resistance genes, particularly Tet, Sul, Erm, and TEM, across all zones. Resistance patterns were similar regardless of comorbidity status and age groups, although ABCF, ANT (3"), and Dfr were slightly more common among individuals with underlying or clinical conditions. In contrast, NDM, OXA, PBP1a, PBP2x, Qnr, SHV, ANT (4'), ANT (6), and APH (3') were detected at low levels, suggesting limited dissemination of resistance to advanced

antibiotics.

Conclusion: Widespread resistance to commonly used antibiotics highlights the need to strengthen antimicrobial stewardship, enforce prescription-only antibiotic use, and integrate genomic surveillance to guide evidence-based treatment of respiratory infections in Tanzania.

KEYWORDS: Antimicrobial resistance gene; Acute respiratory pathogens; Genomic

OR-AMR-14

Burden, Diagnostic Practices, and Antibiotic Resistance Patterns of Urinary Tract Infections in Tanzania.

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Background: Urinary tract infection (UTI) is one of the most commonly diagnosed conditions in Tanzanian health facilities and a major driver of antibiotic use. Diagnosis is frequently based on clinical symptoms or basic laboratory tests without microbiological confirmation, raising concerns about misdiagnosis, overtreatment, and antimicrobial resistance.

Methods: A nationwide mixed-methods cross-sectional study was conducted between February and June 2023 to assess the burden of UTI, diagnostic practices, and antimicrobial resistance patterns. Patients with presumptive UTI were enrolled, urine cultures and antimicrobial susceptibility testing were performed at higher-level facilities, and medical records were retrospectively reviewed to assess diagnostic and treatment practices. Knowledge of UTI among patients and healthcare providers was evaluated using structured questionnaires aligned with standard guidelines. Supportive supervision was assessed through key informant interviews and review of supervision records. Descriptive statistical and thematic analyses were conducted.

Results: 7,743 patients were diagnosed with UTI between 1st October and 31st December 2022 were reviewed. Of these, 7,142 (92.2%) had documented laboratory investigations, while 601 (7.8%) were diagnosed without any laboratory testing. Among those tested, 5,015 patients had laboratory findings consistent with the clinician's diagnosis. However, 2,127 patients had urine test results not suggestive of UTI but were still diagnosed and treated with antibiotics, indicating an overdiagnosis rate of 29.8%. Of the 310 urine samples subjected to culture and antimicrobial susceptibility testing, 64 were culture-positive, yielding a UTI prevalence of 20.7%. *Escherichia coli* was the predominant uropathogen and demonstrated high levels of antimicrobial resistance. Nitrofurantoin remained effective against most Gram-positive and Gram-negative organisms. Overdiagnosis was associated with limited diagnostic capacity, inadequate knowledge among patients and providers, lack of standardized UTI guidelines, and insufficient supportive supervision.

Conclusion: UTI is substantially overdiagnosed and overtreated in Tanzania. Strengthening laboratory-guided diagnosis, standardizing UTI management, and reinforcing antimicrobial stewardship through targeted training and supervision are urgently needed.

KEYWORDS: Urinary tract infection (UTI); Antimicrobial resistance; Over-diagnosis

OR-AMR-15

Prevalence and Antimicrobial Resistance Patterns of Uropathogens in Urinary Tract Infections at Ngamiani Health Centre in Tanga, Tanzania

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Introduction: The gold-standard diagnosis for urinary tract infections (UTIs) is culture. Most health centres in Tanzania lack microbiological laboratories. They rely on dipstick tests for UTI diagnosis. Henceforth data gap on antimicrobial resistance (AMR). This study aimed to assess the accuracy of urinalysis using dipstick test and microscopy for the UTIs and assess AMR among patients attending Ngamiani Health Centre in Tanga, Tanzania.

Methods: The cross-sectional study was conducted from 2023 to 2025. Urine samples were analysed for UTI using dipstick test, microscopy and culture to detect the presence of leucocytes esterase, nitrate by dipstick and microscopy. Culture was done to detect bacteria isolates and then antimicrobial susceptibility testing was performed.

Results: Of the 822 patients, 717 (87.2%) and 683 (78.2%) were female and aged 18-49 years, respectively. The leucocyte esterase and nitrite in dipstick test were positive in 748 (91.8%) and 103 (13.3%), respectively. Microscopy positive was 749 (91.1%), but only 151(18.4%) were positive by urine culture. Out of 151 bacteria isolates the leading were *Escherichia coli* 102 (67.6%), *Staphylococcus aureus* 14 (9.3%), *Klebsiella pneumoniae* 10 (6.6%) and *Enterococcus faecalis* 9 (6.0%). *E. coli* isolates were sensitive to nitrofurantoin at 99.1% and meropenem at 99.3% but majority were resistant to routinely prescribed namely cefotaxime (37.2%) and ciprofloxacin (44.7%).

Conclusion: Discrepancies in UTI prevalence between dipstick test and culture highlights the risk of overdiagnosis and potential overtreatment. The need for accurate UTI diagnosis by culture is justified to prevent unnecessary use of antibiotics. AMR is demonstrated for most of the routinely prescribed antibiotics. There is a need to develop readily available and affordable algorithms that can enrich detection of UTIs where culture is not available. This will enhance appropriate antimicrobials prescriptions and containment of AMR.

KEYWORDS: Urinary Tract Infections; Dipsticks; Microscopy; Urine culture; Antimicrobial resistance

OR-AMR-17

Contextualising Antimicrobial Stewardship: A Qualitative Evaluation of an Antimicrobial Resistance Control Pilot Intervention in Pastoral and Agro-Pastoral Communities of Northern Tanzania

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Background: Antimicrobial resistance (AMR) poses a critical One Health challenge, particularly in low- and middle-income settings where livestock systems underpin livelihoods and access to veterinary services is unequal. In northern Tanzania, inappropriate antimicrobial use (AMU) in livestock production reflects not only infrastructural constraints but also locally embedded knowledge systems and practices. While previous interventions focus on technical solutions, there's limited understanding of how community-based, context-sensitive strategies are received, adapted, and sustained. We conducted an evaluation of the socio-cultural and institutional barriers and enablers, and emergent best practices associated with three intervention-messenger models (engaging Livestock Field Officer (LFO) alone; LFO with a champion farmer; champion farmer alone) implemented among pastoral and agro-pastoral communities in Longido and Arumeru districts.

Methods: A qualitative, post-intervention design was used. Twelve focus group discussions and eight key informant interviews were conducted with farmers, LFOs, and champion farmers. Participants were purposively

selected to capture diverse perspectives. Data were analysed thematically.

Results: Participants demonstrated strong recall and acceptance of intervention messages, particularly regarding prudent antimicrobial use, correct dosing, and veterinary consultation, across both districts. Tools such as weigh bands, treatment records, and drug containers were adopted to varying degrees, with greater uptake observed in Longido compared to Arumeru. Reported benefits included reduced antimicrobial use, improved animal health, and enhanced relationships with animal health providers. Persistent challenges included limited technical knowledge, inconsistent tool use, structural barriers to service access, and tensions with para-veterinary actors.

Conclusion: These findings suggest that participatory, context-sensitive AMR interventions can reshape livestock health practices in Tanzania. Sustained impact needs ongoing community engagement, institutional support, and adaptation to local socio-economic conditions. We recommend integrating these approaches into national livestock health programs and conducting further research to inform scale-up. Furthermore, involving social science perspectives is crucial for effective, scalable AMR control strategies.

KEYWORDS: Antimicrobial stewardship; Antimicrobial Resistance; One Health; Agro-pastoral systems, Tanzania

OR-ARB-01

Prevalence of Arbovirus Infections in Tanzania: A Systematic Review and Meta-Analysis

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Background: Arboviral infections pose a growing public health challenge in Tanzania due to favourable ecological conditions for vector transmission. However, the overall burden and distribution remain insufficiently quantified. This review aimed to synthesize evidence and estimate the pooled prevalence of arbovirus infections in Tanzania.

Methods: A systematic review and meta-analysis were conducted using studies published between January 2005 and December 2025. PubMed, ScienceDirect, Scopus, and Google Scholar were searched for studies reporting arbovirus prevalence among human populations in Tanzania. Data were independently extracted by two reviewers. Study quality and risk of bias were assessed using the Joanna Briggs Institute (JBI) critical appraisal tools. Pooled prevalence was estimated using a random-effects generalized linear mixed-effects model, with subgroup analyses by diagnostic methods and virus types. Heterogeneity was assessed using the I^2 statistic, and publication bias was evaluated through a funnel plot.

Results: Of 858 studies identified, 33 studies involving 18,242 participants were included. The overall pooled prevalence of arbovirus infections was 11% (95% CI: 7%–16%). Serological methods (IgG/IgM ELISA) showed a pooled prevalence of 9.2% (95% CI: 4%–17%), including 3.4% for IgG and 3.8% for IgM. Molecular detection (PCR) showed a prevalence of 6.6% (95% CI: 3%–12%), while rapid diagnostic tests indicated 8.7% (95% CI: 2%–20%). By virus type, prevalence estimates were 6.2% (CHIKV), 5.0% (DENV), 6.6% (RVFV), 1.6% (WNV), 0.7% (YFV), 6.8% (ZIKV), and 1.3% (CCHFV). Infections were predominantly reported in the Eastern, Northern, and Lake Zones, with lower occurrence in the Central and Southern Highlands.

Conclusion: Arbovirus infections present a notable burden in Tanzania, with variation across diagnostic methods and regions. Strengthening surveillance, enhancing diagnostic capacity, and implementing targeted prevention and control strategies are essential to reduce transmission. PROSPERO Registration: CRD420251239880

KEYWORDS: Arbovirus infections; Sero-epidemiological prevalence; Prevalence; Systematic review; Meta-analysis; Tanzania

Human Papilloma Virus Vaccine Uptake and its Determinants among Parents of Adolescent girls in Tanga city, Tanzania

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Background: Human papillomavirus (HPV) is the leading cause of cervical cancer, a major public health challenge in Tanzania. National and global efforts continue to prioritise HPV vaccination; however, coverage remains suboptimal. In Tanga City, no prior data exists on HPV vaccine uptake. This study assesses HPV vaccine uptake and factors influencing parental acceptance among girls aged 9–14 years.

Methods: A community-based cross-sectional study was conducted among 409 parents or guardians selected through multistage cluster sampling. Data were collected using structured interviewer-administered questionnaires. Descriptive statistics determined uptake, while log-binomial regression analysis was performed to identify predictors of HPV vaccine uptake, with significance set at $p < 0.05$.

Results: HPV vaccine uptake was 57.2%. Parental age <30 years (aPR = 0.411; 95% CI: 0.221–0.765), secondary education (aPR = 0.340; 95% CI: 0.124–0.930) and living within 5 km of a vaccination point (aPR = 0.478; 95% CI: 0.246–0.929), were associated with lower uptake, while being married and school-based vaccination increased uptake (aPR = 2.898; 95% CI: 1.723–4.876; aPR = 10.275; 95% CI: 5.518–19.133). Knowledge, attitudes, and healthcare worker recommendation showed no significant association in the multivariate model.

Conclusion: HPV vaccine uptake in Tanga remains below national and global targets (90%). Parental demographics, access-related factors, and school-based delivery play a central role in uptake. Strengthening school-based vaccination, enhancing parent engagement, particularly among younger and more educated parents, and addressing contextual barriers may improve coverage and contribute to cervical cancer prevention efforts in Tanzania.

KEYWORDS: Human papillomavirus; Human papillomavirus vaccine; Uptake of HPV vaccine; Tanga; Tanzania.

Knowledge and acceptability of male HPV vaccination among adolescents and community gatekeepers in northwest Tanzania: Social sciences in the add-vacc trial

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Introduction: Human papillomavirus (HPV) is a global health concerns affecting both males and females. Achievement of WHO's 2030 cervical cancer elimination target requires HPV prevention strategies beyond girls-only vaccination. The Add-Vacc trial in rural northwest Tanzania is evaluating the impact of adding one-time, single-dose HPV vaccination of 14–18-year-old boys alongside the girls-only national HPV vaccination programme on HPV population prevalence. This study aimed to assess acceptability of boys' HPV vaccination among adolescents and community gatekeepers.

Methods: Purposively sampled, qualitative data were collected July 2023–May 2024 through: 1) rapid ethnography (n=25); 2) e-rumours tracking using a pilot-tool (n=266); 3) in-depth interviews with in- and out-of-school boys who accepted or declined vaccination (n=20); 4) key informant interviews with vaccination gatekeepers including parents, teachers, health workers, and community leaders (n=17); and 5) focus group discussions with gatekeepers and vaccination-age boys and girls (n=11). Nvivo12 supported data coding; data triangulated and analysed thematically to support validity.

Results: Messaging on HPV-related complications beyond cervical cancer motivated parental and adolescent support for vaccinating both boys and girls. Framing male HPV vaccination as a gender equity issue and highlighting the economic burden of illness emerged as important themes. Participants emphasised need for trusted, locally recognised messengers to convey information. Parents and peers were key influencers for adolescents; health workers and religious/community leaders influenced parents. Some parents and adolescents who initially declined vaccination reported they later accepted it after having time to reflect and seeing vaccinated boys experienced no adverse effects.

Conclusion: Male, single-dose HPV vaccination was generally acceptable across all study groups. Ongoing, dynamic community engagement is essential for building vaccine trust. Consider HPV vaccination messaging describing the full spectrum of HPV-related sequelae if national HPV vaccination programmes consider offering HPV vaccination to both girls and boys.

KEYWORDS: Sub-Saharan Africa; vaccine decision-making; HPV vaccination; gender equity; qualitative research

OR-CD-01

Effects of Dwelling Time and Storage Conditions on the Efficacy of Transfluthrin Passive Emanators against Malaria and Arbovirus Vectors

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Background: Spatial emanators are recognized as complementary vector control tools reducing human-mosquito contact. However, evaluation parameters such as pre-deployment waiting time here refer to “dwelling time” and storage conditions remain insufficiently standardised; This study evaluated the effects of dwelling time and cold storage on the efficacy of transfluthrin passive emanators under semi-field conditions.

Methods: Experiments were conducted using susceptible *Anopheles gambiae* s.s., susceptible *Aedes aegypti*, and metabolically resistant *Ae. aegypti*. Using a 3×3 Latin square design, emanators were tested at dwell times of 45 minutes and 2 hours, followed by comparison of fresh emanators with those stored at 4 °C for 30 days. Each experiment included nine replicates with 50 mosquitoes per strain. Mosquito landing was measured using human landing catches, and recaptured mosquitoes were monitored for 72 hour delayed mortality.

Results: Increasing dwell time from 45 minutes to 2 hours significantly reduced landing in susceptible *Ae. aegypti* (42.4% vs 24.1%; OR = 0.40, 95% CI: 0.30–0.54; $p < 0.001$) and resistant *Ae. aegypti* (48.8% vs 38.9%; OR = 0.65, 95% CI: 0.50–0.85; $p = 0.002$), but not in *An. gambiae* (OR = 1.03; $p = 0.83$). Mortality remained low (<5%) across species and dwell times. Cold storage did not reduce efficacy; landing rates with stored emanators were comparable to fresh in *An. gambiae* and resistant *Ae. aegypti*, and lower in susceptible *Ae. aegypti* (OR = 0.74, 95% CI: 0.56–0.99; $p = 0.040$).

Conclusion: Emanators provided substantial landing inhibition, with efficacy influenced by dwell time, species, and resistance status. A minimum dwell time of 2 hours is recommended to optimise protection against *Aedes aegypti*, while storage at 4 °C for up to 30 days does not compromise efficacy. Standardised evaluation protocols are needed to maximise impact in vector control programmes.

KEYWORDS: Spatial emanator; Dwelling time; Storage condition; *Aedes*; *Anopheles*

Molecular detection of dengue and west nile viruses among patients with acute febrile illnesses in Tanzania

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Background: Identification of infectious causes of acute febrile illnesses in health care settings is limited. We conducted a survey to identify causative pathogens among patients with acute febrile illnesses in selected health care facilities in Tanzania.

Methods: Four regions were purposely selected namely Dar es Salaam, Mbeya, Kagera and Arusha. After obtaining informed consent, patients with a body temperature of $\geq 38^{\circ}\text{C}$ were enrolled, and blood samples collected. Rapid detection of malaria, HIV, dengue and brucella were done at a point of care. Nucleic acid extraction and Multiplex PCR using the Tropical Fever Panel were done at NIMR Dar es Salaam and Mbeya laboratories.

Results: A total of 476 patients were enrolled between April and July 2025. The majority were females (n=251, 52.7%). The median (IQR) age was 6 (2-29) years. Rapid tests detected 8 cases of dengue virus all came from Dar es Salaam, 28 malaria cases (20 from Kagera, 5 from Dar es Salaam, and 3 from Arusha), and 2 new HIV infection cases both from Dar es Salaam. Multiplex PCR was performed for 293 participant specimens. Dengue (n=43, 14.6%) and West Nile (n=1, 0.3%) viruses were detected all were from Tanzanian nationals with no recent history of travel outside the country. The majority of dengue cases were from Dar es Salaam (n=41, 95.3%) that were detected throughout the study period. Two cases were from Arusha were detected in July 2025.

Conclusion: PCR-based tests can improve pathogen detection in acute febrile illnesses and inform patient management and public health response. Further study for molecular characterization of dengue and West Nile viruses circulating in Tanzania is recommended.

KEYWORDS: Acute febrile illnesses; Dengue; West Nile; molecular diagnostics

Diverse Pathogen Spectrum and Co-infections in Acute Febrile and Respiratory illness in Tanzania

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Background: Acute febrile illness (AFI) and acute respiratory infections (ARI) remain major causes of morbidity in Tanzania. Overlapping clinical presentations and limited diagnostic capacity for non-malarial and respiratory pathogens lead to misdiagnosis and empirical treatment. This study aimed to characterize etiologies and establish laboratory-based surveillance using multiplex molecular diagnostics for improved pathogen detection

Methodology: A prospective, hospital-based epidemiological study was conducted across four Tanzanian regions (Dar es Salaam, Mbeya, Arusha, and Kagera). Participants meeting eligibility criteria were enrolled upon providing consent. Blood and respiratory swab samples were collected and processed for plasma separation and nucleic acid extraction. Pathogen detection was performed using IgM ELISA, multiplex PCR, and uniplex PCR assays

Results: A total of 615 participants were enrolled, with some presenting overlapping AFI and ARI symptoms. Overall, 476 (55.3%) were classified as AFI and 385 (44.7%) as ARI cases. Individuals aged ≥ 5 years had a higher burden of both AFI and ARI than those aged ≤ 5 years, with females more affected than males. Both viral and bacterial pathogens were found. Among AFI cases, the detected pathogens included *Coxiella* spp. (59.6%), Dengue virus (14.7%), Malaria (5.04%), *Brucella* spp. (3.5%), and West Nile virus infection (0.3%). For ARI case, viral pathogens included influenza A/B (37.1%), Respiratory Syncytial Virus infection (19.4%), SARS-CoV-2 (15.4%), and metapneumovirus (2.8%)., Human adenovirus, rhinovirus, human bocavirus, and seasonal coronaviruses (229E, NL63, OC43) were also detected. Bacterial pathogens included *Streptococcus pneumoniae* (51.5%), *Haemophilus influenzae* (51.9%), and *Bordetella* spp. (0.7% each). Notably, diverse co-infections were observed in both ARI and AFI cases.

Conclusion: Our study highlights a broad spectrum of viral and bacterial pathogens contributing to AFI and ARI in Tanzania, with frequent co-infections. Strengthening multiplex diagnostics and integrated surveillance is essential to improve case management, reduce misdiagnosis, and inform targeted public health interventions.

KEYWORDS: Acute febrile illness; Acute Respiratory illness; Pathogen spectrum

OR-CD-05

Respiratory tract microbiota among acute respiratory infection (ARI) cases in Tanzania: a targeted next-generation sequencing study

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Background: The respiratory tract microbiota functions as a gatekeeper, shaping microbial interactions that affect host homeostasis and susceptibility to infection. In Tanzania, routine influenza-like illness (ILI) and severe acute respiratory infection (SARI) surveillance relies on targeted qPCR assays that detect a limited range of microorganisms in acute respiratory infection (ARI) cases, leaving the broader microbial commensals unexplored. This study aimed to characterize the respiratory tract microbiota among ARIs cases within Tanzania's sentinel surveillance system using targeted next-generation sequencing (tNGS).

Methods: We analyzed 484 nasopharyngeal and oropharyngeal swab specimens collected from five geographic zones between October 2023 and September 2024. Total nucleic acids were extracted using Qiagen's Allprep Mini assay and sequenced using the Illumina Respiratory Pathogen ID/AMR Enrichment Panel (RPIP). Data were processed using the Illumina BaseSpace Explify® platform for quality filtering, host read removal, and taxonomic classification. After filtering and metadata integration, 322 samples were included for downstream analysis.

Results: A total of 1,435 commensal microbiota were identified, predominantly bacterial (98.2%), with a small proportion of fungi (1.8%). The most prevalent bacterial taxa included *Rothia mucilaginosa* (73.9%), *Prevotella melaninogenica* (39.8%), *Veillonella parvula* (29.5%), and *Gemella haemolysans* (26.7%). Across different geographical zones, the Lake zone showed a higher prevalence of *Dialister pneumosintes* (20.5%, $p = 0.002$) and *Prevotella intermedia* (9.1%, $p = 0.016$) compared to other zones. Conversely, the respiratory tract microbiota exhibited generally weak correlations with ARI symptoms, with some taxa such as *Veillonella parvula* associated with increased symptom severity, and others, such as *Rothia mucilaginosa* and *Corynebacterium pseudodiphtheriticum* linked to decreased symptom severity

KEYWORDS: Acute Respiratory Infection (ARI); Respiratory Tract Microbiota; Targeted Next-Generation Sequencing (tNGS); Tanzania Sentinel Surveillance; Respiratory Commensal Bacteria

OR-CD-06

Long-Term Immune Profiling of COVID-19 Recovered Patients: Effects of Disease Severity and Vaccination

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Introduction: The COVID-19 pandemic caused varied disease outcomes globally, with individuals experiencing severe, non-severe, or no disease. Immune responses generated post-exposure to SARS-CoV-2 play a critical role in protecting against severe COVID-19 upon re-infection. This study aimed to analyze immune cell phenotypes and functions in COVID-19 Recovered Patients (C-19RPs) with varying disease severity, more than 6 months post-infection.

Methods: We enrolled 101 C-19RPs with hospital data (median age 31) at Mbeya Zonal Referral Hospital, Tanzania. In addition, 7 uninfected and 19 Actively Infected Patients (AIPs) (median ages of 34 and 58.5, respectively) were included as controls. Blood samples were collected for SARS-CoV-2 serology, immune and genomic analysis, whereas demographic and vaccination data were gathered through a questionnaire.

Results: Serum anti-SARS-CoV-2 levels were similar between severe and non-severe C-19RPs but significantly higher in vaccinated non-severe cases than in unvaccinated ones. T-cell responses to SARS-CoV-2 nucleocapsid peptides were unaffected. However, severe C-19RPs showed increased CD8 cytokine responses and degranulation upon stimulation with *Staphylococcus enterotoxin B* (SEB). The NK subset with a high cytotoxic potential was elevated in severe C-19RPs. DNA sequence analysis of the HLA from 18 C-19RPs and five uninfected participants revealed 11 and 20 alleles, which were exclusively found in severe and non-severe C-19RPs, respectively.

Conclusion: COVID-19 vaccination was particularly beneficial for non-severe C-19RPs, underscoring its value in this group. Frequencies of B and NK cell subsets were long-term altered in the C-19RPs. The enhanced T-cell response to SEB in severe C-19RPs suggests the potential for long-term T-cell hyperresponsiveness, warranting further research. Although our HLA results are more exploratory, they highlight the importance of integrating

African genomic diversity into global immunogenetic studies. This may provide preliminary signals that can guide future large-scale investigations of host susceptibility and/or response to SARS-CoV-2.

KEYWORDS: Immune profiling; COVID-19 severity; HLA alleles; COVID-19 vaccination; SARS-CoV-2 immunity.

OR-CD-07

Evaluation of decentralised GeneXpert point-of-care multiplex testing for SARS-CoV-2, influenza, and respiratory syncytial virus in Sub-Saharan Africa

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Introduction: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a novel virus that primarily affects the respiratory tract and causes coronavirus disease 2019 (COVID-19). The COVID-19 pandemic is highly transmissible and has a short incubation period, which has significantly strained healthcare systems. This study aimed to evaluate the diagnostic accuracy of the Xpert Xpress SARS-CoV-2/Flu/RSV test using the decentralised GeneXpert platform for multiplex detection of SARS-CoV-2, influenza A/B, and respiratory syncytial virus (RSV).

Methods: A cross-sectional survey was conducted in Burkina Faso, the Democratic Republic of Congo (DR Congo), and Tanzania. Nasopharyngeal swabs were collected from patients aged 5 years and above with signs and symptoms suggestive of SARS-CoV-2 infection. Collected specimens were tested by the GeneXpert platform. As part of quality control, a subset of positive and negative specimens was randomly selected and analysed by RT-qPCR.

Results: A total of 3549 study participants were enrolled in the study: Burkina Faso, 1196 (33.7%), DR Congo, 1200 (33.8%) and Tanzania, 1153 (32.5%). The overall prevalence of SARS-CoV-2 was 444 (12.5%), of which DR Congo had the highest prevalence, 159 (12%). The sensitivity and specificity of Xpert Xpress SARS-CoV-2/Flu/RSV for SARS-CoV-2 was 87% (95% CI: 81% - 91%), and 85% (95% CI: 83 - 87), respectively. The test accuracy was 85% (95% CI: 83 - 87). Other respiratory viruses detected were Influenza A virus 317/3549 (8.9%), Influenza B virus 137/3549 (3.8%) and RSV 24/3549 (0.7%).

Conclusion: the Xpert Xpress SARS-CoV-2/Flu/RSV demonstrates moderate sensitivity but high specificity, making it a valuable tool for screening and differential diagnosis of respiratory viral infections in resource-limited settings. However, RT-qPCR remains the gold standard for definitive diagnosis, underscoring the need for strategic integration of both approaches to optimise public health responses to disease surveillance of SARS-CoV-2, influenza, and RSV, supporting decentralised respiratory diagnosis.

KEYWORDS: SARS-COV-2; GENEXPERT; DECENTRALISED

OR-CHOL-01

Determinants of Cholera Transmission in Mpwapwa District Council, Dodoma Region, Tanzania: An Unmatched Case-Control Study, December 2025.

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Background: Cholera remains a recurrent public health problem in Tanzania, especially in areas with inadequate water, sanitation, and hygiene (WASH) services. On 15 December 2025, Mwapwa District Council in Dodoma Region reported a cholera outbreak centered in Malolo Ward. A multidisciplinary team investigated to identify transmission determinants and guide response measures.

Methods: An unmatched case-control study with a 1:3 ratio was conducted. Cases were individuals aged >2 years who developed acute watery diarrhea with or without vomiting before 15 December 2025, while controls were randomly selected residents from the same hamlets without symptoms. Data on demographics, environmental, and behavioral factors were collected using a standardized questionnaire. Bivariate and multivariable logistic regression analyses were performed to assess associations between exposures and disease occurrence.

Results: A total of 37 cases and 111 controls were enrolled. The epidemic curve indicated a common-source outbreak, and *Vibrio cholera* was isolated from water samples collected from River Sasima. Children aged 0-4 years accounted for a higher proportion of cases (40.5%) compared to controls (30.6%). Independent risk factors included not treating drinking water (aOR=31.0; 95% CI: 2.90-343.28) and sharing drinking water with a case (aOR=4.5; 95% CI: 1.39-14.47). Protective factors were handwashing before eating (aOR=0.1; 95% CI: 0.01-0.60) and cholera awareness (aOR=0.2; 95% CI: 0.06-0.74). During the response, 250 residents received health education, and 111 households were supplied with water treatment tablets.

Conclusion: The outbreak was driven by contaminated surface water and poor hygiene practices. Rapid investigation and coordinated response measures successfully limited transmission and prevented fatalities. Strengthening WASH services and surveillance systems is essential to prevent future outbreaks,

KEYWORDS: *Vibrio cholerae*; Case control study; Water sanitaion and hygiene

OR-DIG-04

The Assessment of Completeness and Consistency of Routine Malaria data across Health Facility levels in mainland Tanzania

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Introduction: Routine malaria data are important aspect of the program to monitor disease burden and intervention coverage. Health facilities generate data that are recorded on three core HMIS tools: registers, tally sheets and summary reports. However, data inconsistency and incompleteness are widely reported. This assessment aimed to review records of patients from these tools to identify availability of tools, completeness and consistency.

Methods: Health facility cross-sectional survey was conducted to review records and analyze to determine the level of consistency, completeness and accuracy at facility levels. This assessment was conducted in four (4) regions and twelve (12) councils. The records review and counts was done in departments diagnosing and dispensing malaria commodities. The ratio of counts between HMIS tools was the outcome of interest where a ratio of 1 indicate perfect consistency, but we considered a range between 1.2 and 0.8 to account for $\pm 20\%$ deviations that may arise due human errors during counting.

Results: Overall, more than 90% of facility levels were using standard registers and summary reports more than tally sheets. Records between registers and tally sheets were largely inconsistent at all facility levels, only 21% of records were matching between tools (dispensaries), 15% in health Centre and 5% in hospitals. Likewise, between tally sheets against summary reports, 7-28% of the facilities had matching records while higher matching rates (56-87.2%) was recorded between summary reports and district health information system (DHIS2) across facility levels.

Conclusion: Mismatch between tools remains common practices across facility types. It suggests that data collected are not properly aggregated and submitted reports are questionable. This may result into unreliable national health statistics, weak disease surveillance, delayed outbreak detection, poor planning and misallocation of resources. Improve data consistency and completeness across all HMIS tools with focus on strengthening tally sheet use and data reconciliation.

KEYWORDS: malaria data quality assessment

OR-DIG-05

From Data to Decisions: Preparing Analysis-Ready Surveillance Data for Subnational Malaria Tailoring in Tanzania

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Introduction: Availability of electronic health information systems such as District Health Information Software 2 (DHIS2) and the Master Facility List (MFL) has expanded the use of routine surveillance data for malaria modelling to support decision-making. However, these data are not originally designed for analytical or modelling purposes, requiring extensive pre-processing to produce reliable and analysis-ready inputs. Despite increasing application of DHIS2 data for subnational tailoring (SNT) and risk stratification, standardized and reproducible data processing workflows remain poorly documented. This study outlines procedures used to prepare DHIS2 malaria indicators from 2017 to 2024 for SNT in Tanzania Mainland, while highlighting key practical considerations and challenges.

Methods: Facility-level malaria testing indicators, disaggregated by age (<5 and ≥5 years), were extracted from DHIS2, standardized, and linked to the MFL using health facility identifiers. Council names were harmonized to align DHIS2 data with the shapefile. Facilities that never reported malaria indicators during the study period were excluded. Because DHIS2 does not distinguish zeros from missing values, missing values in low-risk areas were assumed to be zeros, while those in moderate- and high-risk areas were treated as true missing. Records with confirmed cases exceeding tests and extreme outliers identified using the interquartile range method were set to missing. All identified missing values were subsequently filled using imputation methods.

Results: There were more health facilities in DHIS2 than in the MFL, resulting in some facilities lacking MFL information after joining. 3 council names in DHIS2 were mismatched with the shapefile. There were more missing values in low-risk strata compared to moderate- and high-risk strata. Anomalies identified, including one facility reporting ~120,000 tests in a month compared to typical values in the hundreds.

Conclusion: The systematic framework presented here provides a transparent and reproducible approach for preparing routine malaria data for downstream analyses and decision-making.

KEYWORDS: malaria; subnational tailoring; DHIS2; Preparation; Tanzania

OR-GEN-01

Conserved genetic and antigenic profiles of Pf12 and Pf41 in asymptomatic Plasmodium falciparum carriers in Tanzania

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Background: Plasmodium falciparum remains a major cause of mortality in malaria-endemic regions, and strain-specific immunity limits vaccine efficacy. The 6-cysteine proteins Pf12 and Pf41 are proposed blood-stage vaccine candidates, yet their diversity and antigenicity in asymptomatic carriers are poorly defined. 172 P. falciparum isolates from asymptomatic individuals in Tanzania were analyzed.

Methodology: Genomic DNA extracted from dried blood spots was amplified by PCR and subsequently sequenced to evaluate genetic diversity. IgG responses to recombinant Pf12 and Pf41 were quantified using a protein microarray. Statistical analyses included Spearman's correlation to assess antibody associations and unpaired t-tests to compare IgG levels between parasite-positive and parasite-negative individuals.

Results: Both genes exhibited low nucleotide diversity (pf12 $\pi = 0.00042 \pm 0.00007$; pf41 $\pi = 0.00061 \pm 0.00004$). Neutrality test indicated an excess of rare variants consistent with recent population expansion. Haplotype network showed limited regional differentiation, supporting strong conservation. Pf12 and Pf41 elicited high IgG seropositivity (97.7% and 98.3%), with strongly correlated antibody levels ($p = 0.758$, $p < 0.001$). A predominant Pf41 substitution, S232R (47.8%), and rare Asn/His variants (0.6%) were detected. Overall, both proteins display limited polymorphism and robust IgG recognition, features consistent with exposure-driven immunity.

Conclusion: These findings highlight conserved merozoite antigens that warrant further investigations for their biological relevance and vaccine potential.

KEYWORDS: Asymptomatic; malaria; antigenic; profiles; falciparum

OR-HIV-01

Determining the Value of Correlates of Protection to Ascertain Pneumococcal Vaccine Efficacy in Adults Living With HIV, A Scoping Review

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Background: People Living With HIV (PLWH) remain at risk of severe pneumococcal disease. In the scoping review, we synthesised evidence on Correlates of Protection (CoP) to ascertain pneumococcal vaccine efficacy in adult PLWH and identify knowledge gaps.

Methods: In 2024, we applied the JBI framework; 3123 studies were identified across five databases. Our search strategy used 17 keywords in Covidence software. Out of 1574 studies, 1274 were excluded. 300 studies left for full review, and 56 for data extraction. Results: 90.7% were RCT from high-income countries and 59.3% of participants were males aged 18-84. In 57.3% RCTs supporting vaccination with pneumococcal conjugate vaccine (PCV), series to 23-valent polysaccharide vaccine (PPSV23) after 8 weeks, were safe and well tolerated. Serum IgG titers assessed by ELISA showed 2-7-fold GMC increases after PCV vs <2-4-fold after PPSV23. OPA revealed 2-4-fold rises in PLWH. Optimal responses correlated with CD4+ > 200 cells/mm³ and viral loads < 1000 copies/ml. Pneumococcal carriage was 7.3%, and mucosal salivary IgA increased 48-fold post-vaccination with CD4+ < 200 cells/mm³. Memory B-cell responses were higher following PCV13 but lower after PPSV23, with no significant changes after PCV7 vaccination. After PCV13, increased IL2-6-12 expression and decreased IL-7 correlated with a 2-fold rise in IgG in pregnant women. Antibody levels tend to wane by one year in adult PLWH with CD4+ > 200 cells/mm³.

Conclusion: In the first scoping review, the paucity of data on CoP and carriage studies among adult PLWH is evident in our setting. RCTs from HICs remain the gold standard for supporting CoP. PCVs offer better protection than PPSV23 alone, with long-lasting immunity, and PCV13 appears to be the best option in the prime boost

regimen with PPSV23 in adult PLWH. OPA titers correlate with ELISA but reflect actual protective immune responses in HIV, where antibody function is compromised. Studies are needed to determine the titer beyond one year with a diverse race.

KEYWORDS: Adult PLWH; Pneumococcal Vaccine; CoP; Pneumococcal Carriage; Pneumococcal IgG; OPA; and Commorbidities

OR-HIV-02

Human Immunodeficiency Virus prevalence and associated factors among males aged 15-49 years in Tanzania: Analysis of the 2022 Tanzania Demographic and Health Survey

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Background: Human Immunodeficiency Virus (HIV) remains a major global public health challenge, affecting approximately 40.8 million people worldwide. Globally, HIV prevalence among adults aged 15-49 years is estimated at 0.7%, with Sub-Saharan Africa accounting for nearly 68% of the burden. In Tanzania, the national adult HIV prevalence is 4.4%, with a lower prevalence among men (3%) than women. Regional variations exist, ranging from 12.7% in Njombe to 1% in Lindi. Men are also less likely to know their HIV status, with only 78.4% aware of their status compared to 84.8% of women. Factors such as circumcision status, multiple sexual partners, and sexually transmitted infections (STIs) may contribute to HIV risk among men.

Methods: A cross-sectional analysis of 3,593 men aged 15-49 years from the 2022 Tanzania Demographic and Health Survey was conducted. Variables included socio-demographic, behavioral, and STI history factors. HIV prevalence was summarized descriptively. Bivariate logistic regression ($p < 0.2$) identified variables for multivariable analysis to estimate adjusted odds ratios (aOR) with 95% confidence intervals. Analyses accounted for complex survey design using Stata 17, and the regional distribution of HIV cases was mapped using QGIS.

Results: HIV prevalence among males aged 15-49 years was 1.9% (95% CI: 1.4-2.5). Prevalence was highest among men aged 45-49 years (4.2%; aOR 9.56, 95% CI: 2.15-40.66). Divorced men had higher odds of HIV infection (6.9%; aOR 2.79, 95% CI: 1.15-6.78), while circumcision was protective (aOR 0.43, 95% CI: 0.23-0.80). No significant associations with residence, employment status, or STI history. Mbeya, Iringa, and Njombe recorded the highest number of cases. Conclusion HIV prevalence among Tanzanian men aged 15-49 years was 1.9%. Age, marital status, and circumcision status were significant predictors of infection. Higher case concentrations in southern regions highlight the need for geographically targeted interventions to accelerate progress toward the 95-95-95 HIV targets.

KEYWORDS: HIV prevalence; men aged 15-49 years; circumcision; marital status; cross-sectional study

OR-HIV-03

Disclosure of HIV status and its association with quality of life and depressive symptoms among children with HIV in North-Eastern Tanzania

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Background: Disclosing HIV status to children with HIV (CWHIV) is associated with improved antiretroviral therapy (ART) adherence, quality of life, and psychosocial well-being in many sub-Saharan Africa. However, little is known about this in Tanzania. We determine the prevalence of HIV status disclosure and its association with health-related quality of life (HRQOL) and depressive symptoms in CWHIV in the Tanga Region, Tanzania.

Methods: A cross-sectional study was conducted in 11 public HIV clinics among caregiver-CWHIV pairs in 2023. Data were collected on socio-demographic, child's HIV disclosure, depressive symptoms, ART adherence, and HRQOL. Multiple linear and negative binomial regression analyses assessed associations between independent variables (HIV disclosure/other factors) and HRQOL (primary outcome), and depressive symptoms (secondary outcome), respectively.

Results: Two hundred and seventy-eight CWHIV aged 8-14 years and their caregivers were enrolled. Most caregivers (80.58%) were female. Three-quarters (75.90%) of CWHIV knew their HIV status. Two-thirds (68.71%) of CWHIV reported adherence to ART. HIV disclosed versus non-disclosed CWHIV had 4.57 units higher HRQOL (coefficient = 4.57, 95% CI: 0.87, 8.27; $p = 0.016$). Higher depression scores (coefficient = -1.09, 95% CI: -1.30, -0.87; $p < 0.001$ and ART non-adherence (coefficient = -4.27, 95% CI: -7.07, -1.48, $p = 0.003$) were inversely associated with HRQOL. There was no significant association between HIV disclosure and depressive symptoms, whereas ART non-adherence was significantly associated with higher depressive symptom scores (coefficient = 0.28, 95% CI: 0.06, 0.49, $p = 0.013$).

Conclusion: HIV disclosure was associated with better HRQOL but not with any worsened depressive symptoms. Interventions that promote HIV status disclosure at the recommended age are therefore important in the care of CWHIV.

KEYWORDS: Disclosure; HIV status; depressive symptoms; quality of life; children; Tanzania

OR-HIV-04

Comparative Analysis of Estimated Glomerular Filtration Rate in People Living with HIV on ART in AFRICOS Study

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Background: Renal dysfunction is a significant issue in people living with HIV (PLWH). A sustained estimated glomerular filtration rate (eGFR) reduction (<60 ml/min/1.73 m²) indicates chronic kidney disease. This study aims to assess the association between ART regimen and eGFR among PLWH.

Methodology: AFRICOS is an observational cohort study which has been enrolling people living with and without HIV in Kenya, Nigeria, Tanzania, and Uganda since 2013. Creatinine levels were assessed at six-monthly visits until 2020 and then assessed annually. This analysis included PLWH with at least two visits on ART regimens which included anchor drugs DTG, efavirenz (EFV), nevirapine (NVP), or a protease inhibitor (PI). Participants were excluded if they had prevalent persistently reduced eGFR, defined as eGFR <60 at their first two visits. Paired t-tests compared eGFR before and after switching to DTG. The association between ART regimen and incident persistently reduced eGFR (<60 at two consecutive visits) was also evaluated using Cox proportional hazards models.

Results: As of 1 March 2024, 3,275 PLWH on ART were enrolled: 2,630 met inclusion criteria for this analysis. Of these, 99 (3.8%) had incident persistently reduced eGFR. Among the 1,080 participants who switched to DTG during follow-up and had a visit 90-270 days after the switch, eGFR decreased significantly for all prior ART regimens (Figure). However, ART regimen was not associated with incidence of persistently reduced eGFR, possibly due to more subtle changes in eGFR following the switch to DTG.

Conclusion: While ART regimen was not significantly linked to persistently reduced eGFR, switching to DTG was associated with a decrease in eGFR, regardless of prior ART regimen. This could highlight changes in kidney function that may not be detected with a focus only on binary normal vs reduced eGFR. Further research is needed to understand the long-term renal effects of DTG.

KEYWORDS: AFRICOS; people living with HIV; eGFR; DTG

OR-HIV-05

Safety and Antiviral Effect of 10E8.4/ibalizumab in People Living with HIV: A Phase 1b Trial

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Background: Broadly-neutralizing antibodies (bNAbs) show promise for HIV care. The bispecific antibody 10E8.4/ibalizumab (10E8.4/iMab) has arms that target the HIV-1 envelope membrane proximal external region (10E8.4) and the CD4 receptor (iMab). It has broad and potent in vitro HIV neutralization ability. We conducted a phase 1b, open label trial of 10E8.4/iMab to assess safety and antiviral effect with and without the CD4 binding site bNAb VRC07-523LS.

Methods: Between October 2023 and April 2025, 20 participants were enrolled at Mbeya, Tanzania. Participants were ART-naïve, had HIV RNA ≥ 1000 copies/mL and CD4 ≥ 300 cells/ μ L. They were enrolled into 5 arms with bNAbs administered either intravenously (IV) or intramuscularly (IM). The arms were; oral ART, a single dose of either 10E8.4/iMab at 600mg IV, 600mg IM, 1800mg IV, or a single dose of 10E8.4/iMab 1800mg IV with VRC07-523LS 1200mg IV. Primary endpoints were adverse events (AEs) and change in HIV RNA from day 0 to 14. HIV RNA and serum concentration of 10E8.4/iMab were measured at different time points.

Results: Of 117 participants screened, 20 were enrolled, of whom 15 (75.0%) were female with a median age of 28 years. Participants had a median HIV RNA at enrollment of 38450 copies/mL. Most participants (80%) reported mild to moderate AEs. There were 2 serious AEs (elevated liver enzymes) that were deemed unrelated to study products. Antiviral effect was observed in all groups, with HIV RNA decreased from day 0 to 14 by a median of 38760 in arm 1, 16854 in arm 2, 285350 in arm 3, 50833 in arm 4, and 37974 in arm 5 ($p=0.205$). Conversely, serum 10E8.4/iMab peaked on day 1 and decreased by day 14. Conclusions 10E8.4/iMab administered at various doses, IM or IV, with or without VRC07-523LS, was safe and tolerable with similar antiviral effects to oral ART alone.

OR-HIV-06

Perception and Uptake of COVID-19 Vaccine among People Living with HIV and Healthcare Workers in selected areas of Tanzania: A cross-sectional study

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Background: People living with HIV (PLHIV) are at an increased risk of severe outcomes from COVID-19 compared to the general population. Similarly, healthcare workers (HCWs) face a higher risk of exposure to COVID-19 due to their occupational environment. This study aimed to assess perceptions toward COVID-19 vaccines and their uptake among PLHIV and HCWs in selected regions of Tanzania.

Methods: A cross-sectional study was conducted in selected regions of Tanzania, namely Dar es Salaam, Geita, Kagera, and Tabora. Data were collected electronically from PLHIV and HCWs using Open Data Kit (ODK) software and subsequently exported to statistical software for analysis. Data analysis was performed using Stata version 14.1 (StataCorp, Texas, USA). Descriptive statistics were used to summarize socio-demographic characteristics, vaccine perceptions, and uptake. Bivariate analysis was conducted to assess associations between variables using Chi-square or Fisher's exact tests, as appropriate.

Results: A total of 1,507 participants were enrolled, including 1,100 (73.0%) PLHIV and 407 (27.0%) HCWs. Of all participants, 1,006 (66.8%) were female and 501 (33.2%) were male, with ages ranging from 18 to 60 years. There were 824 married participants (54.7%), and 716 of them (47.5%) had only a primary school education. Among PLHIV, 946 (86.0%) perceived the COVID-19 vaccine as important, while 43 (3.9%) did not. A statistically significant association was observed between vaccination status and perceived importance of the vaccine ($p = 0.001$). Among HCWs, 382 (93.8%) perceived the vaccine as important for disease control, and 373 had been vaccinated.

Conclusion: The majority of both PLHIV and HCWs demonstrated positive perceptions toward COVID-19 vaccines and high uptake levels. However, negative perceptions, though minimal, were associated with lower vaccination uptake. Targeted interventions addressing vaccine hesitancy are recommended to improve coverage among these key populations further.

KEYWORDS: Perception; COVID-19 Vaccines; PLHIV; Tanzania

OR-HIV-07

Prevalence and Determinants of Hepatitis B Virus Infection Among Adults in Tanzania: A Cross-Sectional Analysis of the 2022-2023 Tanzania HIV Impact Survey

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Background: Hepatitis B virus (HBV) infection remains a major public health concern globally, with a substantial burden in sub-Saharan Africa. Evidence on nationally representative estimates of HBV prevalence and its determinants among adults is limited. This study assessed the prevalence and determinants of HBV infection among adults in Tanzania using recent nationwide survey data.

Methods: We conducted a cross-sectional analysis of data from the 2022–2023 Tanzania Human Immunodeficiency Virus (HIV) Impact Survey (THIS), a nationally representative household survey of individuals aged ≥ 15 years. HBV infection was defined as seropositivity for hepatitis B surface antigen (HBsAg). Weighted prevalence estimates were calculated by sex across sociodemographic and clinical characteristics. Logistic regression models were fitted to estimate crude and adjusted odds ratios (aORs) with 95% confidence intervals (CIs), accounting for the complex survey design.

Results: Among 33,263 adults, the overall weighted prevalence of HBV infection was 3.5% (95% CI: 3.2–3.9), with a higher prevalence among males (4.4%) than females (2.7%). HBV prevalence increased with age, peaking among individuals aged 35–49 years, and was consistently higher among males. Higher odds of HBV infection were observed among people living with HIV, those reporting household exposure to hepatitis B or C, and residents of the Lake and Western zones, while lower odds were observed in Zanzibar. Prior HBV vaccination was strongly protective, reducing the odds of infection by approximately 70%. Education level and household wealth were not independently associated with HBV infection after adjustment.

Conclusion: HBV infection remains a public health concern among adults in Tanzania, with marked disparities by age, sex, HIV status, and geographic location. Expanding adult HBV screening and vaccination, integrating HBV services into HIV programs, and targeting high-burden regions are essential to achieving hepatitis elimination goals by 2030.

KEYWORDS: Hepatitis B; prevalence; determinants; Tanzania; HIV Impact Survey

OR-HIV-08

Health Provider Perspectives on the Effectiveness of Enhanced Adherence Counselling for Pregnant and Breastfeeding Women Living with HIV

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Background: Despite widespread access to antiretroviral therapy (ART) for pregnant and breastfeeding women living with HIV (WLWH), challenges with treatment adherence and viral suppression persist, increasing the risk of vertical HIV transmission. Enhanced adherence counselling (EAC) provides targeted support for WLWH on ART. However, little is known about how well EAC addresses the complex barriers faced by WLWH. This study explored health providers' perceptions of challenges faced by pregnant and breastfeeding WLWH and the perceived effectiveness of EAC in addressing these challenges.

Methods: We conducted a convergent mixed-methods study between August and November 2024 at selected health facilities in Mozambique and Tanzania. Health providers, including nurses, counsellors, and mentor mothers, completed an anonymous, self-administered survey ranking key adherence challenges and the extent to which EAC addresses them. Focus group discussions (FGDs) were then conducted using interview guides informed

by the social ecological framework to explore these issues further. Quantitative data were analyzed using descriptive statistics, while qualitative data were analyzed thematically.

Results: A total of 147 health providers completed the survey; 80% were female, with a median age of 35 years (IQR: 30–42). Most were nurses (63%) and counsellors (26%), with a median of 5 years of experience. Stigma, fear of HIV status disclosure, and poverty were major adherence challenges but were perceived as inadequately addressed by enhanced adherence counselling (EAC). Additionally, 90 providers participated in 11 focus group discussions, highlighting stigma, fear of disclosure, limited counselling time, and the lack of private counselling spaces.

Conclusion: Although EAC is widely implemented within prevention of vertical transmission programs, significant gaps remain between the challenges faced by WLWH and the ability of EAC to address them. Strengthening stigma reduction strategies, safe HIV status disclosure, and improving counselling environments are essential to enhance ART adherence and viral suppression among WLWH.

OR-HIV-09

Prevalence of HIV among exposed infants, A five years retrospective case study in Tanga, Tanzania.

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Introduction: Early infant diagnosis (EID) of HIV among exposed infants is recommended for early detection HIV infection and timely treatment hereby improving survival, and reducing disease progression. Due to maternal HIV antibodies persisting in infants for several months, the test is done using reverse transcriptase chain reaction (RT-PCR).

Objective: To determine prevalence of HIV among infants born to HIV positive mothers between 2020 and 2024 in Tanga Region, Tanzania.

Methods: A retrospective analysis was conducted using data generated between 2020 and 2024 from RT-PCR testing of dried blood spot (DBS) samples collected from infants born to HIV positive mothers at NIMR Tanga Centre Laboratory. Data were managed and analyzed using STATA version 15.

Results: Data showed that, among 4,668 infants, 2.4% (n= 111) were HIV positive. Additionally, in the year 2020, 2021, 2022, 2023 and 2024, 2.8% (n= 9), 2.1% (n= 11), 3.6% (n= 41), 2.0% (n= 32) and 1.7% (n= 18) infants were HIV positive respectively. Female infants accounted for 51.5% (n= 2,403) of the study population.

Conclusion: The findings revealed a notable prevalence of HIV among exposed infants in Tanga over the last five years. In the study area, there is a need to strengthen HIV interventions, including adherence to antiretroviral therapy (ART) among mothers, provision of ART prophylaxis for infants, enrollment of HIV-positive pregnant women in prevention of mother-to-child transmission (PMTCT) services, and linkage to care and treatment clinics (CTC). A prospective study to explore risk factors associated with HIV infection among exposed infants is recommended.

KEYWORDS: Early Infant diagnosis (EID); Human Immunodeficiency Virus (HIV); Exposed; Tanga; Tanzania.

OR-HIV-10

Associations of Early Reproductive Aging with Excess Heart Age and Diastolic Dysfunction Among Women Living with and Without HIV in Mwanza, Tanzania

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Background/

Introduction: Cardiovascular disease (CVD) is a leading cause of mortality among women globally. Women with HIV (WWH) face an elevated risk due to chronic immune activation and traditional risk factors. Early reproductive aging, marked by reduced ovarian reserve and earlier menopause, may exacerbate this vulnerability, yet its impact on subclinical outcomes in sub-Saharan Africa (SSA) remains understudied. This study investigated the associations between early reproductive aging and two subclinical cardiovascular outcomes; excess heart age (EHA) and diastolic dysfunction (DD) in WWH compared to women without HIV (WWoH).

Methods: We conducted a secondary analysis of baseline data from 690 women (348 WWH, 342 WWoH) aged ≥ 30 years in Mwanza, Tanzania. Reproductive status was categorized using menstrual history and anti-Müllerian hormone (AMH) levels into three groups: premenopausal, premenopausal with reduced ovarian reserve, and postmenopausal. EHA was calculated using Framingham Risk Score (FRS) algorithms, with EHA ≥ 5 years as the primary vascular outcome. DD was assessed via standard echocardiography. Multivariable logistic regression models were used to assess associations.

Results: The median age was 45 years for WWH and 43 years for WWoH. Overall prevalence of EHA ≥ 5 years was 24.5%. In adjusted models, both postmenopausal status (OR 5.09; 95% CI 3.41–7.58; $p < 0.001$) and premenopausal status with reduced ovarian reserve (OR 2.80; 95% CI 1.57–5.01; $p < 0.001$) were strongly associated with EHA ≥ 5 years. DD prevalence was 14.5% and was not independently associated with reproductive aging after adjustment. Instead, SBP was the primary independent factor associated with DD (OR 1.03; 95% CI 1.02–1.05; $p < 0.001$).

Conclusion: Early reproductive aging is a potent independent factor for accelerated vascular aging (EHA) in both WWH and WWoH, while DD is more directly linked to hemodynamic factors like SBP. We recommend integrating reproductive health assessments into cardiovascular screening for midlife women in Tanzania.

KEYWORDS: HIV; diastolic dysfunction; heart age; reproductive aging; women

OR-HIV-11

Socio-demographic determinants of COVID-19 vaccination status among people living with HIV; A cross-sectional study in selected regions in Tanzania

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Background: Public Health and Social Measures (PHSM) and vaccination are key strategies for preventing COVID-19 transmission. Vaccination has been widely used to protect against severe infectious diseases, including COVID-19. People living with HIV (PLHIV) are more vulnerable to severe COVID-19 outcomes compared to the general population. Other high-risk groups include the elderly and individuals with comorbidities such as cancer, cardiovascular diseases, and diabetes.

Objectives: To determine socio-demographic factors associated with COVID-19 vaccination among PLHIV in selected regions of mainland Tanzania and provide insights to improve vaccine coverage.

Methods: A facility-based cross-sectional study was conducted between March and April 2022 among PLHIV in Kagera, Tabora, Geita, and Dar es Salaam.

Results: A total of 25 Care and Treatment Centres (CTCs) were selected using probability proportional to size. In each facility, 11 eligible PLHIV were systematically sampled. Data were collected through face-to-face interviews using a structured questionnaire and Open Data Kit (ODK). Analysis was performed using Stata 14. Chi-square

tests assessed associations, and a generalized linear mixed-effects model identified factors associated with vaccination status.

Results: Among 1,100 participants, 696 (63.3%) were vaccinated against COVID-19. Vaccination status was significantly associated with education level, age, occupation, employment status, residence, and facility level. Higher uptake was observed among participants with college or university education, older age groups, farmers, employed individuals, and those residing in rural areas.

Conclusion: COVID-19 vaccination coverage among PLHIV (63.3%) was higher than in the general population (<5% as reported by the MoH), likely reflecting targeted public and private sector efforts. However, additional tailored interventions are needed to sustain and expand coverage. Strategies should include improving access in urban areas, expanding vaccination sites, addressing barriers to uptake, and engaging younger populations. Strengthening service delivery at higher-level health facilities may further enhance vaccination coverage among PLHIV.

KEYWORDS: Socio-demographic determinants; Vaccination status; COVID-19; PLHIV

OR-MAL-01

Risk factors for malaria among school-age children in low and high transmission settings in mainland Tanzania.

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Introduction: School-age children (SAC) are increasingly recognized as an important reservoir of malaria infection in endemic settings. We analyzed data from the 2021 School Malaria and Parasitological Survey (SMPS) to compare individual-level factors associated with malaria across schools with contrasting prevalence in mainland Tanzania.

Methods: A total of 49,935 SAC were included, each SAC was assigned to a prevalence metric group to indicate either coming from a low ($\leq 5\%$) or high ($\geq 30\%$) malaria prevalence school. Prevalence was determined by mRDT. The $\leq 5\%$ and $\geq 30\%$ cutoffs correspond to the WHO stratification of endemicity. A multilevel logistic regression models adjusted for potential confounders were used to assess risk factors.

Results: Of 500 schools, 77.2% were low and 22.8% high prevalence, with malaria prevalence 0.6% and 45.3% respectively (75-fold difference). Age was associated with increased risk in high prevalence schools (AOR = 1.13; 95% CI: 1.03–1.23 for 9–12 years; AOR = 1.19; 95% CI: 1.06–1.32 for 13–16 yrs). Male sex was a risk factor in both groups, with a larger effect in low-prevalence schools (AOR = 2.11; 95% CI: 1.32–3.38) than in high (AOR = 1.49; 95% CI: 1.29–1.71). Altitude was protective in both groups, strongest at altitudes >1750m asl in low prevalence group (AOR = 0.22; 95% CI: 0.07–0.63), versus high (AOR = 0.64; 95% CI: 0.32–1.28). Mosquito net use reduced risk in both groups, with stronger protection in low (AOR = 0.46; 95% CI: 0.29–0.74) than high prevalence schools (AOR = 0.62; 95% CI: 0.53–0.72). Seeking care at health facility was protective only in low prevalence, while proximity to a health facility (<5 km) was associated with reduced malaria risk only in high prevalence schools.

Conclusion: These findings underscore marked heterogeneity in malaria risk across transmission settings and support the need for targeted, context-specific interventions to sustain control and prevent resurgence.

KEYWORDS: Disease heterogeneity; stratification; reservoir; School Survey; Epidemiology

OR-MAL-02

Country-Led Use of Local Data to Tailor Malaria Interventions Under Limited Resources: Findings from Tanzania's Subnational Exemplar

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Background: Malaria is one of the most devastating preventive diseases affecting half the world population. The World Health Organization and the Roll Back Malaria Partnership to End Malaria launched the “high burden to high impact” approach in November 2018, a country-led approach using local data and evidence to Subnationally Tailor (SNT) malaria interventions to optimize impact under limited resources. This study shares how Tanzania institutionalized SNT towards malaria elimination.

Objectives: To examine barriers and facilitators to planning, implementing, and sustaining the SNT malaria interventions to optimize impact on transmission and burden of disease.

Methods: Mixed-methods approach was used to understand the design, implementation, and operationalization of SNT in the country. It involved a desk review, process mapping, and 44 key informant interviews.

Results: Enablers for different domains and barriers are presented. In generating the evidence, SNT was institutionalized by embedding in core policy planning cycles for malaria control. There were links to multi-source data architecture of high-completeness of routine data combined with district-representative data sets. Barriers included persistent low data quality weakening confidence in granular stratification and limited integration of supplementary and climatic data into SNT analysis. Synthesizing the evidence involved active stakeholders' engagement with partner-supported modelling while decisions remain country-owned. National algorithms and localized tools produced simple color-coded maps for districts planning and implementation. The barrier was dependence on external modelling capacity. Acting on evidence was based on fully stratified national plans linked to budgets, so financing followed the stratification with strong systems and growing domestic financing to fill donor gaps. Barriers were shortage of financial and human resources and technical skills to fully uptake SNT intervention packages, especially at district level. Policy Implication Country-led approach using local data, active stakeholders' engagement and use of evidence to tailor malaria interventions is key to optimize impact under limited resources.

KEYWORDS: Malaria; Tanzania; Tailoring; policy; health system; elimination

OR-MAL-03

Efficacy, safety and tolerability of triple Artemisinin-based combination therapies versus first-line ACTs plus placebo for treatment of uncomplicated *Plasmodium falciparum* malaria in Africa: A partially blinded randomised controlled non-inferiority trial

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Background: In many malaria-endemic settings, Artemisinin-based combination therapies (ACTs) have been deployed as the first-line antimalarial drugs, with significant reduction in global malaria morbidity and mortality over the last decade. However, the recent emergence of artemisinin and partner drug resistance threatens the current malaria control and elimination efforts. Furthermore, new and more productive non-artemisinin

antimalarial drugs may take time to be in the market. Thus, there is an urgent need to evaluate alternative treatments using combinations of existing drugs, including triple ACTs (TACTs), to stall the pace of resistance development and spread. More importantly, in regions where ACTs are still influential, including Sub-Saharan Africa, it is essential to have alternative treatments if multidrug-resistant parasites are imported from elsewhere or emerge de novo.

Objective: The trial aimed to compare the efficacy and safety of ACTs and TACTs as defined by the 42-day PCR-corrected adequate clinical and parasitological response within each individual site.

Methods: An international, multi-centre, partially blinded, randomised, controlled, non-inferiority trial of the Triple ACTs artemether-lumefantrine + amodiaquine (AL+AQ) and artesunate-mefloquine + piperaquine (ASMQ+PPQ) with the ACTs artemether-lumefantrine + placebo (AL+PBO) and artesunate-mefloquine + placebo (AS-MQ+PBO) for the treatment of uncomplicated *Plasmodium falciparum* malaria to assess and compare their efficacy based on expert microscopy and genotyping, safety, and tolerability. Patients were hospitalised for supervised therapy for 72 hours and thereafter followed weekly until day 63.

Results: 4,320 patients with uncomplicated *Plasmodium falciparum* malaria were enrolled in 10 African sites. TACTs were non-inferior to ACTs with the overall efficacy of 100% for AL+AQ vs 96.3% for AL+PBO and 98.5% for ASMQ+PPQ vs 95.3% for ASMQ+PBO. All study arms demonstrated an acceptable safety profiles.

Conclusion: Deployment of Triple Artemisinin Combination Treatments (TACT) could be one of the possible strategies for preventing or delaying the emergence and spread of resistant strains.

KEYWORDS: Malaria; artemisinin resistance

OR-MAL-04

Establishing a Controlled human malaria infection model in an endemic setting.

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Background: Controlled human malaria infection (CHMI) studies play a crucial role in assessing potential interventions and understanding immune protection to inform malaria vaccine development. Blood-stage CHMI offers a more precise means for proof-of-concept testing of blood-stage interventions like vaccines and drugs, bypassing the pre-erythrocytic stages of Malaria infection.

Methods: For the first time in Africa, we aimed to establish a blood-stage CHMI model in an endemic region in a clinical trial involving healthy adults aged 18-45 residing in Bagamoyo, Tanzania. Based on *P. falciparum* anti-schizont IgG serology, twelve participants meeting eligibility criteria were enrolled into "low" (n=6) and "high" (n=6) prior malaria exposure groups. Participants were challenged with approximately 1000 chloroquine-sensitive *P. falciparum* 3D7 clone-infected erythrocytes on day of challenge (C+0) and monitored for 28 days at the Ifakara clinical trial facility in Bagamoyo. Participants underwent twice daily clinical assessments. Blood samples for safety and immunology assessments at designated times points were collected, samples for *P. falciparum* qPCR were collected daily up to C+28. Participants were treated with artemether-lumefantrine and a single low dose of primaquine once pre defined treatment thresholds were met. Participants were discharged at the discretion of the investigators.

Results: Adverse events (AEs) collected reported were mostly mild and rarely moderate, there were no severe or serious AEs. 10 of the 12 participants developed parasitemia detectable by qPCR. There was no significant difference between the median asexual parasite densities at first positive between the two groups. Median time to detectable parasitemia and pre-defined treatment criteria was longer in high prior malaria exposure group

compared to low prior malaria exposure group.

Conclusion: The challenge inoculum was found to be safe with frequency and severity of AEs in keeping with previous challenge studies in other populations. These data support the onward use of this model in assessing Malaria interventions.

KEYWORDS: Malaria; CHMI; Blood stage Malaria infection

OR-MAL-05

Anemia prevalence and associated factors among school-aged children(5-15years) in Geita and Njombe regions, Tanzania (2023).

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Background: Anemia is a major global health problem, disproportionately affecting women and children. In Sub-Saharan Africa, school-aged children bear a high burden, with prevalence in northern-eastern Tanzania estimated at 49.8% in 2022. Anemia contributes to impaired growth, poor cognitive development, and increased morbidity and mortality, particularly among children. However, data on determinants of anemia among Tanzanian school-aged children remain limited. This study assessed the prevalence and associated factors of anemia in Geita and Njombe regions to inform interventions.

Methods: A cross-sectional analysis of secondary data from the 2023 School Malaria and Nutritional Survey was conducted, including 404 children aged 5-15 years. The outcome variable was anemia status (Yes/No). Independent variables included age, sex, region, residence type, malaria test results, stunting, malaria transmission risk strata, and family size. Anemia was defined using WHO age-specific hemoglobin thresholds. Descriptive statistics, chi-square tests, and modified Poisson regression were used to estimate prevalence and associated factors, reported as adjusted prevalence ratios (aPR) with 95% confidence intervals.

Results: The overall anemia prevalence was 33.7% (136/404), with marked regional variation: 49.8% (114/229) in Geita and 12.6% (22/175) in Njombe. Severe anemia was rare (0.8%, 3/404). Anemia was significantly associated with malaria positivity (aPR 1.30; 95% CI: 1.02–1.67), living in mixed rural-urban areas (aPR 2.21; 95% CI: 1.11–4.40), and residence in high (aPR 6.39; 95% CI: 2.46–16.59) or moderate (aPR 7.75; 95% CI: 3.22–18.68) malaria transmission strata. No significant associations were observed with age, sex, family size, or stunting.

Conclusion: Anemia among school-aged children in Geita and Njombe is a moderate public health problem, with a higher burden in Geita. Its association with malaria highlights malaria as a key driver. School-based interventions, including insecticide-treated nets, malaria screening, chemoprophylaxis, and iron supplementation or fortified feeding, are needed to reduce the burden.

KEYWORDS: Anemia; School-aged; Malaria; Tanzania

OR-MAL-06

Malaria's Toll on Education: Insights from Tanzania's School Malaria Parasitological Survey

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Background: The higher rate of parasitemia and asymptomatic infections in school-age children population has a potential to negatively effect school outcomes due to absenteeism and cognitive function. This study utilized Tanzania School Malaria Parasitological Survey (SMPS) data to quantify malaria-influenced school absenteeism and examined the spatio-temporal variations.

Methods: The SMPS was a cross-sectional study adopted a multistage, stratified, proportional probability sampling approach to recruit children 5 – 16 years old from 184 councils. Six rounds have been implemented between 2015 and 2025. The prevalence of absenteeism was computed in two stages of absenteeism; Stage-1: General absenteeism those who missed school due to illness and Stage-2: malaria-related absenteeism where out of general absenteeism fraction mentioned to have fever as proxy for malaria.

Results: A total of 309,316 children were enrolled from 850 primary schools. Median age ranged from 11 years (IQR, 9 – 13) in 2015 to 10 years (IQR, 8 – 12) in 2023. General School absenteeism was high in 2015 at 51.3% (95% CI 50.4 – 52.3) and declined steadily to 11.0% (95% CI 10.8 – 11.3) in 2023. Malaria-related absenteeism; The estimated population attributable fraction of absenteeism attributable to malaria was 0.0125 (95% CI 0.0123 – 0.0126). Older children in the 9 – 12 years (aOR 1.24, 95% CI 1.11 – 1.39; $p < 0.001$) and 13 – 15 years (aOR 1.22, 95% CI 1.05 – 1.42; $p = 0.009$) had higher chance of absenteeism due to fever. The analysis indicated that Geita consistently had the highest proportion of malaria-related school absenteeism over the years.

Conclusion: These findings underscored the potential negative influence of malaria on educational achievements of children. The findings could be used to update the malaria epidemiological profile and stratification of malaria absenteeism to guide the allocation of resources, assessing effectiveness, and prioritize interventions against malaria.

KEYWORDS: Malaria absenteeism; School children; School Malaria Parasitological Survey

OR-MAL-07

Malaria Treatment-Seeking Behaviour among School-Aged Children in Mainland Tanzania: Patterns, Determinants, and Challenges

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Introduction: Appropriate malaria treatment-seeking behaviour is essential for timely diagnosis, treatment, and reducing malaria transmission. While well-studied among children under five, treatment-seeking behaviour among school-aged children (SAC) in Mainland Tanzania has been scarcely examined. This study aimed to characterise patterns and factors associated with treatment-seeking behaviour among SAC.

Methodology: This study utilised data from the 2021 National School Malaria Parasitological Survey, conducted by the Ministry of Health, Tanzania. A total of 21,275 SAC were selected through stratified, proportional-to-size sampling from all regions and all councils of the country. Participants provided self-reported data through a semi-structured questionnaire on socio-demographic information, household size, fever history, mosquito net use, and treatment-seeking behaviour.

Results: Sixteen per cent ($n = 3,406$) of SAC reported a fever within the two weeks before the survey. Of these, 82% ($n = 2,794$) sought treatment, with 71% ($n = 1,997$) at health facilities and 29% ($n = 797$) elsewhere, including drug outlets or traditional healers. Factors significantly associated with seeking treatment included younger age, mosquito net use, exposure to malaria messages, urban residency, and living in high-malaria-risk areas.

Conclusion: While treatment-seeking behaviour was overall high, a notable proportion of SAC, particularly in high-burden zones, exhibited inappropriate care-seeking. These findings highlight the need to enhance healthcare access and improve social behaviour communication strategies, particularly in rural and high-malaria-endemic areas.

KEYWORDS: Treatment-Seeking Behaviour; School-Aged Children; Fever; Malaria

OR-MAL-08

The Impact of Mosquito Bed Net Use on Malaria Prevalence among School-Aged Children in Mainland Tanzania: Evidence from the 2017 and 2021 School Malaria Parasitological Surveys

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Introduction: Tanzania aims to achieve an ITN coverage of above 85% by 2025 through both mass and continuous distribution approaches, including the school net program and reproductive child health clinics. Despite these efforts, there is a paucity of data on the impact of ITN use, particularly among school-age children (SAC).

Methodology: This study analysed data from the School Malaria Parasitological Surveys (SMPS) of 2017 and 2021. The SMPS is a biennial school-based surveillance involving children aged 5–16 years in public primary schools, covering a sample of 650 representative schools selected from all 26 regions and 184 councils of mainland Tanzania. A multilevel mixed-effect logistic regression model was constructed to determine the impact.

Results: The overall malaria prevalence decreased from 15.8% (2017) to 11.8% in the 2021 survey round. The proportion of mosquito bed net users among malaria-infected children was higher in 2017 at 83.9% than in 2021 at 69.1%. Among mosquito bed net users, female children were less likely to have malaria infection than males (AOR=0.80 (0.77-0.84), $p < 0.001$) in 2017, and the odds decreased further (AOR=0.78 (0.71-0.85), $p < 0.001$) in 2021. Using mosquito bed nets showed a higher risk of infection in older children (13-16 years) compared to younger children in both surveys (AOR=1.51(1.40-1.63), $p < 0.001$ in 2017 and (AOR=1.80(1.58-2.05), $p < 0.001$ in 2021). The risk of malaria infection was higher among bed net users within large family sizes (AOR=1.91(1.79-2.05), $p < 0.001$) in 2017 and (AOR=1.56(1.37-1.78), $p < 0.001$ in 2021, compared to those within the smaller family size.

Conclusion: Using a bed net showed significant protection against malaria infection. The risk of malaria increased with age and family size, suggesting gaps in equitable access and consistent use of nets. Thus, efforts to maintain the availability of mosquito bed nets in large families and improve access and use among older SAC are crucial.

KEYWORDS: ITN; Malaria; School-age children

OR-MAL-09

Dynamics of natural immunity to malaria in adults

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Background: While malaria burden has traditionally concentrated on children under five, declining transmission in parts of sub-Saharan Africa has shifted, a growing share of infections to adolescents and adults who now play a key role in sustaining community transmission. Despite this, adults remain underrepresented in malaria research including vaccine trials and long-term immunity studies. The “Dynamics of Natural Immunity to Malaria in Adults” study was designed to address this gap by investigating long-term exposure and immune responses among adults living in low, moderate, and high transmission settings in Tanzania. The study therefore investigate the interplay between parasite exposure and malaria-related immunomodulation.

Methods: This prospective cohort study is conducted in Bagamoyo and Chalinze districts, Tanzania, to assess natural malaria immunity among healthy adults aged 18–55 years followed through for 36 months. Recruitment included community sensitization followed by household census with GPS mapping to the nearest 10 km from health center, demographic surveys, and clinical screening, resulting to enrollment of 450 eligible participants. Enrolled participants are visited at their homes once or twice monthly for parasitemia assessment and once every four months for immunology and safety evaluation. Additional immunological assessments are performed during illness episodes.

Results: The study is expected to generate data on the temporal dynamics of naturally acquired asymptomatic and symptomatic malaria parasitemia in adults residing in different transmission intensity. Also, the study will provide information on possible markers for malaria protective immunity in adults living in different transmission zones. Furthermore, the study will establish a well-characterized cohort with detailed malaria exposure and immune profiles, serving as a valuable registry for future malaria vaccine trials.

Conclusion: This study addresses gaps in adult malaria research by examining parasite exposure and immunomodulation, providing insights to guide interventions, vaccine development, and strengthen health systems.

KEYWORDS: Malaria; Adults; Natural immunity

OR-MAL-10

Mapping malaria prevalence among school-aged children in Tanzania from 2015 to 2023 using sub-council spatiotemporal modelling

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Introduction: Over the past two decades, infectious diseases have continued to account for a substantial global health burden. Among these, malaria remains one of the most important contributors, disproportionately affecting sub-Saharan Africa. Although children under-five years and pregnant women are at greatest risk of severe malaria, school-aged children (SAC) represent an important and under-recognized reservoir of infection. We aimed to generate high-resolution, spatio-temporal estimates of malaria prevalence among SAC in Tanzania to inform targeted control and elimination strategies.

Methods: We analyzed data from five nationally representative School Malaria Parasitological Surveys (2015, 2017, 2019, 2021, 2023) covering 850 georeferenced schools and 311,293 children in mainland Tanzania, defining malaria infection via rapid diagnostic tests and fitting Bayesian geostatistical models with spatial-temporal dependence using INLA to generate 1×1 km *P. falciparum* parasite rate (PfPR5-16) predictions as posterior means with 95% credible intervals, validated via spatially blocked cross-validation.

Results: National average malaria prevalence fell from 22.1% (95% CrI: 21.4–22.8%) in 2015 to 11.4% (10.9–11.9%) in 2023, with high-transmission zones shrinking and concentrating in persistent hotspots around Lake Victoria and southwestern Tanzania, while central, northern, and eastern regions shifted to low transmission (<5%) despite lingering sub-council variation. Prevalence linked positively to rainfall, vegetation, and water proximity, but negatively to elevation, accessibility, and urbanization, and model predictions closely matched observations (correlation 0.92).

Conclusion: Malaria transmission among SAC in Tanzania has declined but remains spatially heterogeneous. High-resolution modelling of SMPS data provides a robust basis for micro-stratification and targeted malaria control.

KEYWORDS: school-aged children; Tanzania; spatiotemporal; malaria prevalence; malaria hotspots

OR-MAL-11

Burden and Determinants of Malaria-Anemia Co-existence among School-Aged Children in Tanzania.

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Background: Malaria remains a major cause of morbidity in sub-Saharan Africa. In endemic settings, school-aged children (SAC) often harbor asymptomatic infections that sustain transmission and contribute to anemia. However, evidence on the burden and determinants of malaria-anemia co-existence among SAC in Tanzania remains limited. This study assessed the burden and factors associated with co-existence among SAC in mainland Tanzania.

Methods: Cross-sectional surveys were conducted in 2023 and 2025 among SAC aged 5–16 years attending public primary schools in mainland Tanzania. Malaria infection was assessed using rapid diagnostic tests (mRDT), and hemoglobin levels were measured using a HemoCue® analyzer. Socio-demographic characteristics and insecticide-treated net (ITN) use were collected using structured questionnaires. Bivariate and multilevel logistic regression models, clustered by region, were used to identify factors associated with co-infection.

Results: A total of 21,807 SAC were included. Malaria prevalence declined from 11.3% in 2023 to 7.3% in 2025, while anemia remained stable (22.1% vs. 21.6%). The odds of malaria-anemia co-infection were significantly lower in 2025 (OR = 0.45, 95% CI: 0.37–0.54, $p < 0.001$). Children with malaria had 2.9 times higher odds of anemia than malaria-negative children (COR = 2.90, 95% CI: 1.96–3.68, $p < 0.001$). Fever was strongly associated with higher odds of co-infection (OR = 3.17, 95% CI: 2.43–4.13, $p < 0.001$), while female sex and ITN use were protective. Urban and mixed residence were associated with reduced odds compared to rural areas. Marked geographical variation was observed, with higher risk in the Lake and Western zones. Co-existence was higher in low-altitude, high-transmission settings and lower in high-altitude, low-transmission areas.

Conclusion: Malaria-anemia co-infection remains a significant but heterogeneous burden among SAC in Tanzania. Strengthening integrated malaria control and nutrition interventions, particularly in high-risk areas, is essential to reduce this dual burden.

KEYWORDS: Malaria; Anemia; children; Tanzania

OR-MAL-12

Bayesian spatial analysis of Plasmodium parasites prevalence and its determinants in selected regions of Mainland Tanzania

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Background: Malaria remains a major public health challenge globally and in Tanzania, driven by persistent Plasmodium parasite transmission and environmental variability. Despite ongoing control efforts, transmission remains heterogeneous and often inadequately captured by routine surveillance systems. Understanding fine-scale spatial patterns of infection and their environmental drivers is essential for improving targeted malaria interventions. This study applied Bayesian spatial modelling to estimate household-level risk and identify micro-hotspots of Plasmodium parasite prevalence in selected regions of Mainland Tanzania.

Methods: Community cross-sectional survey data were collected between July and August 2023 in 13 villages across five regions (Kagera, Kigoma, Njombe, Ruvuma, and Tanga). Individuals aged ≥ 6 months who had resided in the study villages for ≥ 3 months were enrolled and tested for malaria using rapid diagnostic tests, while geospatial data were collected electronically. Household-level Plasmodium parasite risk was modelled using Bayesian geostatistical methods implemented through Integrated Nested Laplace Approximation within a Stochastic Partial Differential Equation framework and presented in posterior mean (PM) and 95% credible interval (CrI). Model performance was assessed using the Watanabe-Akaike Information Criterion.

Results: A total of 8,326 individuals from 1,243 households were included. Models with environmental covariates consistently outperformed null models. Grass cover increased malaria risk in Kyerwa (PM=0.076; 95%CrI:0.040–0.112) while altitude showed a protective effect (PM=−0.002; 95%CrI:−0.003 to −0.001). Shrub cover increased infection risk in Buhigwe (PM=0.119; 95%CrI:0.029–0.210), Nyasa (PM=0.070; 95%CrI:0.005–0.135), and Muheza (PM=0.160; 95%CrI:0.056–0.266). In Ludewa, both shrub (PM=0.512; 95%CrI:0.066–0.989) and grass cover (PM=0.490; 95%CrI:0.117–0.879) increased infection risk, while altitude reduced risk (PM=−0.015; 95%CrI:−0.022 to −0.009). Spatial maps revealed pronounced micro-scale heterogeneity in household-level infection risk.

Conclusions and Recommendations Plasmodium transmission

showed substantial micro-geographic heterogeneity driven by environmental factors and spatial dependence. Vegetation increased infection risk, whereas altitude reduced transmission. Bayesian spatial modelling effectively identified household-level hotspots, highlighting the need for precision-guided malaria interventions to improve control efficiency.

KEYWORDS: Bayesian spatial modelling; Plasmodium parasite prevalence; Malaria transmission; Environmental determinants; Tanzania

OR-MAL-13

Modeling the influence of sleeping behavior and insecticide-treated net use on malaria risk among under-five children in Tanzania

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Background: Despite malaria control efforts in Tanzania, under-five children remain disproportionately affected, reflecting persistent household and behavioral exposure. Although insecticide-treated net use is key, protection may be reduced if children are exposed during early evening mosquito biting. This study assessed whether sleeping behavior and insecticide-treated net independently influence malaria risk after adjusting for demographic, biological, and ecological factors.

Methods: We analyzed nationally representative cross-sectional data using school malaria survey from 9,273 under-five children selected through multistage cluster sampling across 184 districts in all 26 mainland regions of Tanzania. We modeled malaria risk using a generalized linear mixed-effects model (GLMM) with a logit link, and parameters were estimated via maximum likelihood using Laplace approximation

Results: Malaria prevalence was 5.1%, with most children sleeping between 20:00–21:00 hours (32.6%). Prevalence rose across transmission strata, from zero in very low to 25.8% in high-strata children sleeping 21:00–22:00 hours. Poorer households consistently had higher prevalence. Children sleeping 22:00–23:00 hours had higher malaria odds (OR 1.95; 95% CI 1.14–3.55; $p=0.020$). Age remained significant, particularly among two-year-olds (OR 2.28; 95% CI 1.12–4.31; $p=0.024$) and older under-five children (OR 2.06; 95% CI 1.01–4.08; $p=0.049$). Urban residence reduced malaria odds (OR 0.13; 95% CI 0.03–0.49; $p=0.013$), as did mixed residence (OR 0.25; 95% CI 0.07–0.84; $p=0.029$). Children from richest households had substantially lower odds (OR 0.15; 95% CI 0.05–0.41; $p<0.001$). Moderate anemia (OR 3.16; 95% CI 1.78–6.09; $p<0.001$) and severe anemia (OR 78.7; 95% CI 10.2–188; $p<0.001$) were the strongest correlates, while normal acute malnutrition remained significant (OR 0.24; 95% CI 0.09–0.60; $p=0.002$).

Conclusion: Malaria persistence in Tanzanian under-five appears strongly shaped by bedtime behavior, biological vulnerability, and localized transmission heterogeneity, supporting targeted behavioral and geographically tailored malaria control strategies.

KEYWORDS: Malaria risk; under-five children; sleeping behavior; insecticide-treated nets (ITNs); generalized linear mixed model (GLMM)

OR-MAL-14

Assessment of the malaria vaccine candidate SUM-101 in healthy adults aged 18-45 years living in a malaria endemic country.

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Background: Merozoite surface protein 1 (MSP1) is a well-characterized target of humoral immunity against *Plasmodium falciparum*, with strong evidence that antibodies directed against it, expressed prominently on the merozoite surface, contribute to control of asexual parasite growth. A blood-stage malaria vaccine could enhance protection provided by existing pre-erythrocytic vaccines, such as RTS,S/AS01E and R21/Matrix-M. Based on several studies investigating MSP-1, MSP1 is currently considered a prime candidate antigen for vaccine development against malaria. The objective of the study was to assess safety, reactogenicity and immunogenicity of SUM-101 (recombinant, fully length MSP-1 with GLA-SE as adjuvant). This abstract will be based on the safety and immunogenicity results of the vaccine.

Methods: This was a randomized, double-blind, controlled study. Forty participants (male and female) were enrolled. They were randomized in 1:1 ratio to receive three monthly inoculations of SUM-101 (composed of 150 µg MSP-1 drug product + 5 µg GLA-SE adjuvant) and registered rabies vaccine (Verorab®) as controls. Safety data were collected throughout the study period with solicited adverse events (AEs) collected 7 days after each vaccination and unsolicited adverse events (AEs) collected throughout the study period. Samples for safety and immunological laboratory assessments were collected at different timepoints. Primary analysis of immunogenicity was done by summarizing antibody responses over time, and fold changes of antibody responses over time relative to baseline.

Results: The vaccine was safe and well tolerated by study participants in all the three doses of vaccines. Participants in the SUM-101 arm showed increased MSP1-specific IgM and IgG antibody titres from baseline. While participants in the Verorab arm MSP1-specific IgM and IgG antibody titres remained stable throughout follow-up, and no overt fold changes from baseline observed.

Conclusion: We will conclude on the vaccine's safety and immunogenicity based on the safety and immunological data obtained from vaccinated participants.

KEYWORDS: Malaria; Vaccine; SUM-101; healthy adults

OR-MAL-16

Household Socioeconomic Determinants of Malaria Infection among School Age Children: in Tanzania

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Background: Malaria infection remains a major public health threat with school-age children increasingly recognized as reservoir of infection. Control efforts have led to a substantial reduction in cases and deaths over the past two decades. This study examines the association between household socioeconomic factors and malaria infection.

Methods: A cross-sectional survey conducted in among school aged children using structured questionnaire from 6,239 children linked to their households to assess socioeconomic status in mainland Tanzania in 2023. Logistic regression model was applied to assess associations between household socioeconomic factors and malaria infection.

Results: Primary (OR = 0.67, 95% CI: 0.51–0.87), secondary education (OR = 0.58, 95% CI: 0.38–0.89) and employment (OR = 0.40, 95% CI: 0.16–0.99) were associated with reduction of malaria infections while community reported that malaria as the most serious health problem (OR = 1.77, 95% CI: 1.37–2.31), increasing age (OR = 1.04, 95% CI: 1.00–1.08), moderate (OR = 9.37, 95% CI: 4.20–26.7) and high transmission settings (OR = 19.2, 95% CI: 8.65–54.6) increased the odds of infection.

Conclusion: The study found household socioeconomic status influence malaria transmission. Our findings highlight the need for malaria control to addressing socioeconomic disparities alongside targeted interventions.

KEYWORDS: Malaria infection and socioeconomic factors

OR-MAL-17

Barriers to Effective Utilization of Insecticide-Treated Mosquito Nets in Mainland Tanzania: Analysis of the 2021–2025 School Malaria Parasitological Surveys

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Background: Malaria remains a major public health threat in sub-Saharan Africa and treated mosquito nets is the most effective control tool for indoor malaria prevention. Despite increased distribution and ownership of ITNs through government and partner-supported initiatives, evidence from various studies indicates actual utilization remains below the national target of 80 percent.

Methods: Household cross-sectional surveys was conducted from 2021, 2023 and 2025 in mainland Tanzania to collect mosquito net information and utilization using structured questionnaire. A total of 6,015, 6,892 and 13,347 households were respectively involved in the assessment of mosquito nets indicators. These indicators are household ownership, coverage, and population access and utilization. These data were used to generate ITN indicators at region and council levels and identify barriers associated with low utilization

Results: The use to access ratio for ITN increased from 91% in 2021 to 94% in 2023 and declined to 89% in 2025. The use to access ratio remained consistently high across the three survey rounds, indicating that a large proportion of individuals with access to mosquito nets are actually using them. Regression analysis revealed increased number of people with access to treated nets (IRR=1.03; 1.03–1.09), household size (IRR=1.09; 1.08–1.10), population living low income households (IRR=1.07; 1.02–1.12) and moderate malaria transmission areas (IRR=1.08; 1.03–1.13), married/living together couples (IRR=1.22; 1.14–1.30) are significantly associated with increased rates of using mosquito nets.

Conclusion: Our analysis found that higher access, large households and low-income households were significantly increasing rate of utilization, suggesting that need and availability remain important drivers. Additionally, living in moderate malaria transmission areas and in households with married or cohabiting relationship was associated with more utilization, pointing to both environmental risk perception and household structure on utilization behaviors. Prioritize equitable distribution and continuous availability of insecticide-treated nets for large and low-income households and implement targeted behavior change strategies.

KEYWORDS: treated mosquito net utilization

Prevalence of *Plasmodium falciparum* subpatent infections among asymptomatic individuals in five regions of Mainland Tanzania. A community-based cross-sectional study, 2023.

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Background: Asymptomatic individuals in malaria-endemic communities often harbor patent or subpatent infections but rarely seek care, leading to their exclusion from routine surveillance systems. These individuals may carry transmissible gametocytes, sustaining community-level transmission, and may also harbor molecular markers associated with antimalarial drug resistance.

Objective: To assess the prevalence of *Plasmodium falciparum* subpatent infections across regions with varying malaria transmission intensities in Mainland Tanzania.

Methods: Data were derived from a community-based cross-sectional survey conducted between July and August 2023 across five regions representing high, moderate, and very low transmission strata. Participants aged ≥ 6 months were tested using rapid diagnostic tests (RDTs), and dried blood spot (DBS) samples were collected ($n = 9,010$). DNA was extracted from selected RDT-negative samples ($n = 2,899$) using the Tween-Chelex method and analyzed by 18S rRNA quantitative PCR (qPCR) to detect subpatent infections.

Results: Of 2,899 RDT-negative samples, 191 tested positive by qPCR, yielding a prevalence of 6.6% (95% CI: 5.7–7.6). Subpatent infection prevalence was highest among adults (>15 years; 7.5%), followed by school-aged children (5– <15 years; 6.1%), and lowest among children under five (3.5%) ($p = 0.009$). Prevalence and odds of subpatent infections were significantly higher in regions with very low transmission intensity (47.5%, 95% CI: 35.3–60.0; reference) compared to moderate (6.4%, 95% CI: 3.1–12.6; aOR = 0.08) and high transmission settings (5.7%, 95% CI: 4.9–6.7; aOR = 0.07).

Conclusion: Subpatent *P. falciparum* infections are more common among adults and in areas of very low transmission intensity. These findings highlight the need for more sensitive, community-based surveillance strategies to detect asymptomatic carriers who may sustain malaria transmission.

KEYWORDS: Subpatent infections

National-wide Malaria Prevention Knowledge and Community Preventive Practices in mainland Tanzania: Evidence from the National Malaria Parasitological and Nutritional Survey, 2025

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Background: Knowledge of disease preventive approaches in the community remains low and heterogeneous . However, the socio-demographic determinants of the knowledge gap remain inadequately quantified at a national scale.

Objective: To estimate the prevalence of malaria prevention knowledge and community preventive practices, and associated factors

Methods: A national-wide school-aged children cross-sectional survey sampled a total of 68,673 school aged children from 656 public primary schools where a 20% of them was used to determine 13,347 households for survey. Of these households came from rural,peri-urban and urban settings. Adequate knowledge was defined as self reported awareness of ways of preventing malaria and preventive practices. Odds ratios (OR) with 95% CI were used for demographic strata and multivariable logistic regression model estimated adjusted odds ratios (aOR) for age, education level, place of residence and sex of heads of households.

Results: Overall, we found 73.91% of respondents demonstrated adequate malaria prevention knowledge. In multivariable logistic regression analysis, education level was the most important predictor of adequate knowledge, with secondary (aOR = 3.33, 95% CI: 2.80–3.95, $p < 0.0001$) and primary education (aOR = 2.15, 95% CI: 1.95–2.37, $p < 0.0001$) conferring a significantly higher aOR versus no education. Other factor was the place of residence , urban residents showing than 2 folds the aOR of adequate knowledge versus rural residents (aOR =2.11, 95% CI: 1.88–2.37, $p < 0.0001$). The oldest age (≥ 60 years) had significantly lower (aOR = 0.78, 95% CI: 0.70–0.88, $p < 0.0001$). ITNs use was markedly lower in rural areas (39.9%) than urban areas (56.6%).

Conclusion: Education and residence was found as the strong determinants of malaria prevention knowledge. The urban-rural knowledge gradient and secondary education effect identify actionable target groups such as community health workers outreach in rural areas, school-based malaria platform, and adult literacy programs.

KEYWORDS: malaria knowledge; malaria prevention; cross-sectional survey

OR-MAL-20

Malaria Prevention Knowledge and Its Determinants Among School-Children in Tanzania: A National Cross-Sectional Study

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Background: Malaria disproportionately affects school-aged children, however, their knowledge of prevention methods remains poorly characterized. This study assessed the proportion of school-children aged (9–16 years) with adequate malaria prevention knowledge and characterized associated factors.

Methods: School Malaria Parasitological Survey (SMPS), a national-wide cross-sectional survey included 68,673 school-children across Tanzania. Knowledge was defined as correctly identifying (≥ 1) prevention method ($>50\%$ threshold). Multivariate logistic regression was used to analyse the factors.

Results: We found overall 50.77% of school-children had adequate malaria prevention knowledge. Mosquito net usage was the most recognised preventive method (45.94%), followed by burning repellents (10.23%), environmental cleaning (10.23%), and destroying breeding sites (9.06%). Other vector control interventions were unknown, such as IRS (4.70%), door or window closure (4.55%), use of mosquito repellents (2.77%), window screening (1.54%), and larviciding (1.05%). Multivariate logistic regression demonstrated that age as the strongest predictor, children aged 12–16 years had more than 2-fold odds of adequate knowledge compared to school-children aged 9–11 years (cOR = 2.23, 95% CI: 2.02–2.46; aOR = 2.22; $p < 0.001$). Male children had slightly higher odds than females (cOR = 1.10, 95% CI: 1.01–1.21; $p = 0.034$). On the other hand, place of residence was not a significant predictor ($p = 1.000$), after controlling for age and gender, rural-urban disparities in knowledge.

Conclusion: Malaria prevention knowledge among Tanzanian school-children remains inadequate. Younger school-children, female students, and rural residents were found to be most disadvantaged, warranting a need for targeted, age-appropriate health education in Tanzania.

KEYWORDS: malaria knowledge; malaria prevention; cross-sectional survey

OR-MAL-21

Blood-stage controlled human malaria infection (CHMI) in healthy Tanzanian adults to assess the efficacy of the malaria vaccine candidates R78C and/or RH5.1 in Matrix-M® adjuvant.

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Background: An effective blood-stage vaccine against *Plasmodium falciparum* could reduce clinical malaria and severe disease. The PTRAMP-CSS-RH5-CyRPA-RIPR (PCR) invasion complex is a leading vaccine target. RH5.1, targeting reticulocyte-binding protein homologue 5, has shown partial efficacy in African children when formulated with Matrix-M®. R78C, comprising RIPR EGF-like domains fused to CyRPA, is another promising candidate, but its efficacy alone or combined with RH5.1 remains unknown.

Methods: We conducted a Phase I/II open-label age de-escalation trial in Bagamoyo, Tanzania (PACTR202407803870883), to evaluate safety, immunogenicity, and efficacy of RH5.1 and R78C with Matrix-M®. Adults received three doses (0, 1, 6 months) of either R78C/Matrix-M® (Group 1A), R78C+RH5.1/Matrix-M® (Group 1B), or RH5.1/Matrix-M® (Group 1C). Two weeks after the third dose, eligible participants ($n=12$) and infectivity controls ($n=12$) underwent blood-stage controlled human malaria infection (CHMI) with the Pf3D7 strain. Parasitemia was monitored by quantitative PCR.

Results: Twenty-four healthy adults were enrolled (12 vaccinees, 12 controls). CHMI was well tolerated. Parasitemia occurred in 6/12 vaccinees (3 R78C; 3 combination) versus 9/12 controls, with higher peak parasitemia in controls. Vaccination delayed time to detectable parasitemia compared with controls (Kaplan–Meier analysis). Statistical analyses, including log-rank tests and hazard ratios with 95% confidence intervals, have been performed. Immunogenicity analyses are ongoing.

Conclusion: Vaccination with R78C and/or RH5.1 with Matrix-M® reduced the proportion of participants with detectable parasitemia, delayed parasite detection, and lowered parasite density following CHMI, supporting

further evaluation of PCRCR-based blood-stage malaria vaccines.

KEYWORDS: Malaria; vaccine; efficacy; CHMI

OR-MAL-22

Safety and efficacy of malaria vaccine candidate R21/Matrix-M in African children aged 5-36 months: A multicentre, double-blind, randomised, phase III trial

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Background: Malaria remains among diseases with leading global cause of morbidity and mortality. R21/Matrix-M vaccine, is a pre-erythrocytic malaria vaccine developed by University of Oxford, has achieved the WHO target of 75% efficacy in African children and demonstrated promising safety and immunogenicity across trial sites. This study evaluated its protective efficacy against *Plasmodium falciparum* malaria in children aged 5–36 months, as well as safety and reactogenicity within one month after each vaccination and at 12 months following the primary series.

Methodology: This double-blind, phase III randomized controlled trial enrolled 4,800 children aged 5–36 months across multiple African sites, including standard transmission settings (Tanzania [n=600], Kenya) and seasonal transmission settings (Mali, Burkina Faso). Participants were randomized to receive a three-dose primary series of R21/Matrix-M followed by a booster dose at 12 months. Safety, reactogenicity, immunogenicity, and protective efficacy were assessed over two additional years, including evaluation of second and third annual booster doses.

Results: At 12 months post-primary series, vaccine efficacy against clinical malaria was 67% in standard transmission settings and 75% in seasonal settings. A booster dose restored antibody levels and sustained protection into the second year, with enhanced responses at higher adjuvant doses. Antibodies targeting the NANP repeat correlated with protection, with levels >6,500 ELISA units/mL associated with a 77% reduction in malaria risk. The vaccine was well tolerated, with few mild unsolicited adverse events resolving without sequelae. 54 serious adverse events were reported, none leading to sequelae.

Conclusion: This study confirms that a booster dose of R21/Matrix-M at 1 year following the primary three-dose regimen maintained high efficacy against first and multiple episodes of clinical malaria and induced antibody concentrations that correlated with vaccine efficacy

KEYWORDS: Children under five; Malaria Vaccine; Safety; Efficacy

OR-MAL-23

Impact of IPTsc on Malaria Burden: A Difference-in-Differences Analysis of Routine Surveillance Data in Tanzania

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Background: Malaria remains a major public health problem in Tanzania, particularly among school-aged children who contribute to ongoing transmission. Intermittent Preventive Treatment in schoolchildren (IPTsc) was introduced in selected Tanzanian districts to reduce malaria transmission. Despite its rollout, evidence of its programmatic impact using routine data remains scarce. This study evaluated changes in malaria burden

following IPTsc implementation by comparing intervention and non-intervention councils.

Methods: A before-and-after analysis was conducted using routine malaria surveillance data from the District Health Information System 2 (DHIS2). Data from 2023 (pre-implementation) and 2025 (post-implementation) were analyzed. Intervention councils (Kibondo and Nyang'wale) were compared with non-intervention councils (Kasulu DC and Geita DC). Key indicators included confirmed malaria incidence per 1,000 population, mRDT positivity rate, proportion of malaria cases among outpatient department consultations, antenatal care malaria positivity, and malaria-related hospital admissions. Percentage changes were calculated, and a Difference-in-Differences (DiD) approach was used to estimate the net change across indicators

Results: A difference-in-differences analysis showed greater reductions in malaria burden in intervention councils compared to non-intervention councils. Malaria incidence declined by 71.5% in Nyang'wale and 51.8% in Kibondo, compared to a 49.9% reduction in Geita and a 12.8% increase in Kasulu, corresponding to a 43.1 percentage point greater reduction in intervention areas. Similarly, larger declines were observed in mRDT positivity (−24.5 percentage points), malaria admissions (−49.8 percentage points), and OPD malaria proportion (−43.0 percentage points). However, changes in ANC malaria positivity were comparable between intervention and non-intervention councils (+3.3%).

Conclusion: IPTsc implementation was associated with substantial reductions in malaria burden across multiple routine surveillance indicators. The consistent pattern of greater declines in intervention councils suggests a potential program effect. Scaling up IPTsc and strengthening routine surveillance systems could further support malaria control efforts in Tanzania.

KEYWORDS: Malaria; IPTsc; Surveillance Data; School-aged Children; Tanzania

OR-MAL-25

Multisectoral Engagement to Achieve Full Coverage of Public Health Interventions: Lessons Learned from Long-Lasting Insecticidal Nets Implementation in Pwani Region, Tanzania

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Background: Malaria remains a major public health challenge in Tanzania, with moderate-to-high transmission persisting in several regions, including Pwani. Universal access to long-lasting insecticidal nets (LLINs) is critical for malaria control and elimination by 2030. The LLINs targeted campaign provided an opportunity to generate implementation evidence on how multisectoral engagement, digital systems integration, and coordinated leadership can enhance the reach, efficiency, and sustainability of large-scale public health interventions.

Methods: A Targeted Mass Campaign (TMC) was implemented from July to October 2025 across seven councils in Pwani Region using a multisectoral approach to coordinate advocacy, training, household registration, LLIN distribution and issuance processes. A fully digitalized system (TMC-MIS), integrated with MSD's Epicor 10 platform, enabled real-time household registration, logistics management and monitoring. Advocacy meetings, cascading trainings, and community sensitization were conducted to enhance stakeholder participation, community engagement, and local ownership of the campaign.

Results: A total of 454,595 households were registered (110% of the planned target), and 1,236,294 LLINs were distributed across 862 issuing points, achieving 127% of the planned coverage. Overachievement was attributed to accurate registration, strong community engagement, and population growth due to migration. Challenges included hard-to-reach areas, vehicle breakdowns, documentation burdens, and limited network connectivity. Recommendations and

Conclusion: Future campaigns should strengthen multisectoral coordination, expand the use of digital tools with offline functionality, and reinforce logistics for hard-to-reach areas to sustain and improve LLIN coverage. The

Pwani experience demonstrates that coordinated planning, committed leadership, and real-time digital integration can enhance operational efficiency and coverage, providing a scalable and replicable model for malaria control in similar settings

OR-MAL-26

Institutionalizing School-based Malaria Surveillance to Strengthen Subnational Stratification and Policy in Tanzania: A Decade of Implementation (2014-2025).

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Background: Effective subnational malaria control requires timely, high-resolution data, yet national household surveys often lack sufficient spatial detail and frequency. Since 2014, Tanzania has implemented the School Malaria Parasitological Survey (SMPS), a nationwide school-based platform generating council-level malaria prevalence estimates among school-aged children (5–16 years). This study describes its methodological evolution, implementation model, and programmatic integration from 2014 to 2025.

Methods: SMPS is a repeated cross-sectional survey conducted in public primary schools using a standardized sampling framework and implemented by local government teams within routine health and education systems. Data collected include malaria rapid diagnostic tests, hemoglobin levels, insecticide-treated net (ownership, access, use), malaria knowledge and behaviors, exposure to messages, treatment-seeking, anthropometry, and dried blood spots for molecular analysis, alongside geolocation. Data systems transitioned from paper-based to fully digital platforms with standardized analytical workflows.

Results: Across six rounds, 850 schools and 379,206 children were surveyed. Outputs enabled identification of transmission hotspots (notably around Lake Victoria and the southwest), informed geospatial and molecular analyses, and strengthened integration with household and routine data. Findings have guided National Malaria Strategic Plans, Global Fund proposals, vector control strategies, stratification of malaria endemicity according to transmission risks and introduction of intermittent preventive treatment among schoolchildren (IPTsc).

Conclusion: The survey integrates school-based data with routine health facility data to support malaria risk stratification and subnational decision-making. As a policy-embedded platform within routine systems, SMPS demonstrates a scalable approach to decentralized malaria control by generating granular, actionable data. It offers a practical model for strengthening surveillance in endemic settings and provides a sustainable framework for integrating broader school health services, including nutrition assessment.

KEYWORDS: malaria; school-aged children; Tanzania; surveillance

Prevalence and associated factors of dengue virus infection in endemic area in Tanzania

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Background: Dengue is the most prevalent mosquito-borne viral infection, causing an estimated 96 million symptomatic cases and 40,000 deaths annually worldwide. In Tanzania, outbreaks have increased over the past decade, including the 2019 epidemic in Dar es Salaam and Tanga. Despite substantial exposure to Aedes bites, information on transmission dynamics and risk factors remains limited. This study examined factors associated with dengue prevalence and prior exposure in urban and semi-urban Dar es Salaam.

Methods: A cross-sectional survey was conducted among randomly selected adults and children aged over 2 years attending outpatient departments and reproductive and child health clinics in urban and semi-urban Dar es Salaam. Previous dengue virus exposure was assessed using ELISA for IgG antibodies, while current infection was determined using a rapid DENV-specific NS1 antigen test on blood samples. Demographic, socio-economic, and clinical factors associated with dengue exposure were analysed using logistic regression models.

Results: A total of 394 patients were included (82.7% female and 17.3% male; mean age 28.2 ± 14.7 years, range 2-88). The seroprevalence of previous dengue infection based on ELISA IgG was 35.3%, while 1.8% had evidence of current infection by NS1 antigen positivity. Both NS1 and ELISA IgG positivity were significantly higher among males than females (NS1: 5.9% vs 0.9%; $p < 0.005$; IgG: 35.3% vs 19.6%; $p < 0.005$). In logistic regression, female sex was associated with lower odds of dengue exposure compared to males (aOR=0.32; 95% CI: 0.11-0.93; $p = 0.036$). Gender, age above 40, participation in outdoor sports and presence garbage collection near residential area were significantly associated with dengue infection ($P < 0.05$).

Conclusion: The findings indicate continued dengue circulation and highlight behavioural and environmental risk factors. Targeted prevention strategies and strengthened environmental control measures are needed to reduce mosquito breeding and dengue-related morbidity.

Pyrethroid resistance in the dengue fever vector *Aedes aegypti* in urban and semi urban hotspot areas of Dar es Salaam, Tanzania

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Background: Dengue fever remains a major public health threat in Tanzania and is primarily transmitted by *Aedes aegypti*, a vector responsible for several arboviral infections. The emergence of insecticide resistance threatens the effectiveness of vector control interventions and may lead to operational failure. Despite recurrent dengue outbreaks, information on the insecticide susceptibility status of *Aedes aegypti* in Tanzania remains limited. This study assessed the resistance profile of *Aedes aegypti* populations in Dar es Salaam, where multiple dengue outbreaks have been reported.

Methods: A cross-sectional entomological survey was conducted in urban (Temeke) and semi-urban (Kigamboni) districts of Dar es Salaam during the wet season (October 2024–June 2025). One hundred households were randomly selected for larval sampling using district maps. Immature mosquitoes were collected by dipping, reared to adulthood, and morphologically identified. Adult mosquitoes were tested using WHO standard insecticide susceptibility bioassays. Mortality was recorded 24 hours post-exposure and interpreted according to WHO criteria. Piperonyl butoxide (PBO) synergist assays were conducted to assess mono-oxygenase-mediated resistance.

Results: Complete susceptibility (100% mortality) was observed only with pirimiphos-methyl (60 mg/m²) in both districts. Full susceptibility to bendiocarb (0.2%) was detected in Kigamboni (98% mortality), whereas probable resistance was observed in Temeke. Complete resistance was found in both districts to malathion (1.5%) and all tested pyrethroids. Following PBO pre-exposure, partial restoration of susceptibility to deltamethrin (0.03%) was observed only in Kigamboni, while resistance persisted in Temeke. No restoration of susceptibility was observed for lambda-cyhalothrin (0.05%), alpha-cypermethrin (0.05%), or permethrin (0.4%) after PBO exposure.

Conclusion: *Aedes aegypti* populations in Dar es Salaam show widespread resistance to pyrethroids and malathion, with retained susceptibility to pirimiphos-methyl and limited susceptibility to bendiocarb in semi-urban areas. Continuous resistance surveillance and evaluation of alternative insecticides are urgently needed to guide dengue vector control strategies in Tanzania.

OR-MAL-29

Copy number variants underlie major selective sweeps in insecticide resistance genes in *Anopheles arabiensis*

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Background: To keep ahead of the evolution of resistance to insecticides in mosquitoes, national malaria control programmes must make use of a range of insecticides, both old and new, while monitoring resistance mechanisms. *Anopheles arabiensis*, an outdoor-biting vector of growing concern, shows reduced susceptibility to indoor interventions, yet its resistance mechanisms remain poorly understood. Resistance to non-pyrethroids like pirimiphos-methyl (PM) is also inadequately characterized.

Methods: A genome-wide association study was conducted to investigate resistance to deltamethrin and PM in *Anopheles arabiensis* from two Tanzanian regions. Genomic regions of positive selection in these populations

were largely driven by copy number variants (CNVs) in gene families involved in metabolic resistance.

Results: We found evidence of a new gene cluster involved in resistance to PM, identifying a strong selective sweep tied to a CNV in the carboxylesterase genes *Coeae2g* -*Coeae6g*. Using complementary data from another malaria vector, *An. coluzzii*, in Ghana, we show that copy number at this locus is significantly associated with PM resistance. Similarly, for deltamethrin, resistance was strongly associated with a novel CNV allele in the *Cyp6aa/Cyp6p* cluster (*Cyp6aap_Dup33*). Against this background of metabolic resistance, resistance caused by mutations in the insecticide target sites was very rare or absent. Mutations in the pyrethroid target site *Vgsc* were at very low frequency in Tanzania, yet combining these samples with 3 *An. arabiensis* individuals from West Africa revealed a startling evolutionary diversity, with up to 5 independent origins of *Vgsc*-995 mutations found within just 8 haplotypes.

Conclusion: Despite having been first recorded over 10 years ago, *Vgsc* resistance mutations in Tanzanian *An. arabiensis* have remained at stable low frequencies. Overall, our results provide a new copy number marker for monitoring resistance to PM in malaria mosquitoes, and reveal the complex picture of resistance patterns in *An. arabiensis*.

KEYWORDS: Insecticide Resistance; *Anopheles arabiensis*; Tanzania; Selective sweeps

OR-MAL-30

Pyrethroid-resistant malaria vector *Anopheles gambiae* restored susceptibility after pre-exposure to piperonyl-butoxide: results from country-wide insecticide resistance monitoring in Tanzania

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Background: Insecticide-treated nets (ITNs) and indoor residual spraying (IRS) are central to malaria control in Tanzania and globally. However, widespread insecticide resistance threatens their effectiveness, making routine resistance monitoring essential for guiding intervention selection and evaluating program impact.

Methods: A nationwide study was conducted in 22 sentinel districts in Tanzania from May to July 2023 using WHO susceptibility assays with 1x, 5x, and 10x concentrations of deltamethrin, permethrin, and alpha-cypermethrin, and discriminating concentrations of 0.25% pirimiphos-methyl. Synergist assays were performed to investigate mechanisms underlying pyrethroid resistance. Bioassays used 3-5-day-old wild female *Anopheles gambiae* s.l. (F1 generation).

Results: *Anopheles gambiae* s.l. were resistant to all pyrethroids at the discriminating dose in most sentinel districts except in Rorya, which remains fully susceptible, and Ushetu, which remains susceptible to deltamethrin but not permethrin. In 5 sites (Bukombe, Ukerewe, Kilwa, Kibondo, and Kakonko), the *An. gambiae* s.l. species exhibited strong resistance to pyrethroids surviving the 10 X concentrations (mortality rate < 98%). However, they remained fully susceptible to pirimiphos-methyl in almost all the sites except in Kibondo and Shinyanga. Likewise, there was full restoration to susceptibility to pyrethroid following pre-exposure of *An. gambiae* s.l. to

piperonyl-butoxide (PBO) in 13 out of 16 sites. The 3 sites that exhibited partial restoration include Kakonko, Tandahimba, and Newala.

Conclusion: The evidence of widespread pyrethroid resistance of the major malaria vector justifies the decision made by the Tanzania National Malaria Control Programme to transition to PBO-based ITNs. Without this switch, the gains achieved in malaria control could be compromised. Equally important, the lack of full restoration to susceptibility observed in three sentinel districts upon pre-exposure to PBO merits close monitoring, as there could be other underlying resistance mechanisms besides oxidase metabolic resistance.

KEYWORDS: Insecticide resistance; *An. gambiae*; Kdr; PBO; Susceptibility; Pyrethroid; Tanzania

OR-MAL-31

Agricultural Pesticide Use and Potential Contribution to Insecticide Resistance among Dengue and Malaria mosquito Vectors in Mwanza region, Tanzania

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Background: The use of agricultural pesticides in malaria and dengue-endemic settings have contributed to insecticide resistance among mosquito vectors. In Mwanza region, subsistence farming is common and insecticides are frequently used for crop protection. However, limited evidence exists on how agricultural pesticides practices may influence insecticide resistance among malaria and dengue mosquito vectors. This study assessed pesticide use behaviours among farmers and potential contribution to insecticide resistance among dengue and malaria vectors in farming communities.

Methods: Across-sectional study was conducted in 2022 among 160 farmers from four villages in Misungwi, Magu and Kwimba districts. Data were collected using a structured questionnaire capturing farming activities, pesticide use patterns, handling practices, and pesticide-related knowledge. A resistance risk score (range 0–3) was constructed based on pesticide-use behaviours associated with selection pressure. A composite knowledge score (range 0–3) was generated from pesticide-related knowledge indicators. Associations between farmers' characteristics and resistance risk score were examined using Poisson regression with robust standard errors.

Results: Majority of respondents (57.5%) reported ever using pesticides, with insecticides being the predominant type (97.8%). Among pesticide users ($n = 92$), 51.1% mixed pesticides near water sources, 35.9% reported mixing multiple products, and 48.9% were uncertain about the effectiveness of combined spraying. The mean resistance risk score was 1.52 ($SD = 1.02$). In adjusted analysis, knowledge score was independently associated with higher resistance risk score ($aPR = 1.38$; 95% CI: 1.18–1.62; $p < 0.001$). Male farmers had significantly higher resistance risk scores compared to females ($aPR = 1.54$; 95% CI: 1.01–2.35; $p = 0.044$).

Conclusion: Agricultural pesticide practices in rural Mwanza are characterized by intensive insecticide use and behaviours that may increase environmental exposure and selection pressure on mosquito vectors. Integrated strategies linking agricultural pesticide management and mosquito vector control are warranted to mitigate resistance risks.

Temporal Trends of Plasmodium Species Positivity Rates Across regions with varying Transmission intensities in Mainland Tanzania

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Background: Despite sustained malaria control efforts in Tanzania, routine surveillance predominantly focuses on *Plasmodium falciparum*, with limited evidence on non-*falciparum* species. Understanding species-specific trends across transmission settings is critical for elimination strategies.

Objective: To assess temporal trends in *Plasmodium* species distribution across 10 regions within varying malaria transmission strata in Tanzania from 2021 to 2023.

Methods: Repeated cross-sectional health facility cross-sectional surveys were conducted annually across 10 regions representing four transmission strata (very low to high). Dried blood spot samples were collected and DNA extracted using the Chelex method. A total of 9,119 samples (3,221 in 2021; 3,552 in 2022; 2,346 in 2023) were analyzed using quantitative polymerase chain reaction targeting the 18S rRNA gene. Species-specific positivity rates (PR) were compared across years, strata, and age groups.

Results: Overall positivity declined from 56.8% (1829/3221) in 2021 to 52.3% (1227/2346) in 2023 ($p < 0.001$). *P. falciparum* remained dominant but decreased from 55.7% to 51.5% ($p < 0.001$). *P. ovale* declined from 4.8% to 1.5% ($p < 0.001$), while *P. malariae* remained stable (~1.5–1.6%; $p = 0.63$). *P. vivax* was rare (0.09% in 2021 only). PR declined significantly across strata but remained high in high-transmission regions (Kagera, Mtwara) and moderate regions (Mara, Tabora). Notably, substantial PR persisted in low and very low strata (36.8%–47.6%). Adults had the highest infection proportion (40.1%), while infections among under-fives increased from 34.5% in 2021 to 41.2% in 2023 ($p < 0.001$).

Conclusion: Although malaria positivity is declining, *P. malariae* persists as a stable reservoir across all strata, with the lowest PR. Continued transmission in low-burden settings and rising infections among young children highlight gaps in current strategies. Strengthening species-specific molecular surveillance is essential to support targeted interventions and achieve malaria elimination in Tanzania.

KEYWORDS: Plasmodium species; malaria; malaria molecular surveillance; temporal trends; Tanzania

Molecular analysis reveals heterogeneity of *Plasmodium falciparum* infections by region and transmission intensities in Mainland Tanzania

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Background: In Tanzania, malaria diagnosis in routine settings relies on rapid diagnostic tests (RDTs), which provide limited information beyond a positive result. In moderate- and high-transmission areas, antigen persistence may lead to overestimation of active infections, limiting the accuracy of routine surveillance data. Molecular analysis of routinely collected samples offers an opportunity to validate infections and provide additional epidemiological insights.

Objective: To characterize *P. falciparum* infection patterns across transmission strata in Tanzania using molecular methods.

Methods: A cross-sectional analysis was conducted on RDT-positive samples collected between March and December 2025 from outpatients attending 92 health facilities across 26 regions of Mainland Tanzania. A total of 14,183 dried blood spot samples were collected, of which 5,394 samples from 10 regions have been analyzed to date. *Plasmodium* infections were confirmed using quantitative PCR (qPCR). Positivity rates, species distribution, and parasite densities were compared across regions and transmission strata.

Results: Among the analyzed samples, 91.0% (4,906/5,394) were confirmed as malaria-positive by qPCR. Significant regional variation was observed ($p < 0.001$), with *Plasmodium falciparum* positivity ranging from 85.7% to 98.6%. Differences were also evident across transmission strata ($p < 0.001$). *P. falciparum* accounted for the majority of confirmed infections across all settings, with higher proportions in low-transmission areas (96.0%) compared to moderate and high-transmission areas (89.2–91.2%). Parasite density was higher in low and very-low transmission areas (~1,415 parasites/μL) compared to moderate and high-transmission settings (~670 parasites/μL).

Conclusion: Most RDT-positive cases represent true *P. falciparum* infections, though confirmation rates and parasite densities vary across transmission strata. Lower confirmation rates in higher-transmission settings may reflect residual antigen detection, whereas higher parasite densities in low-transmission areas suggest different infection dynamics. Molecular analysis of routinely collected samples provides a practical approach to strengthen malaria surveillance. Analyses are ongoing, and additional results will be presented at the meeting.

KEYWORDS: *Plasmodium falciparum*; malaria; malaria molecular surveillance; heterogeneity; Tanzania

Modelling the impact of adopting new-generation insecticide-treated nets on malaria transmission and insecticide resistance

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Background: The widespread insecticide resistance increasingly threatens malaria elimination, prompting a reassessment of vector control strategies. As Tanzania transitions from standard pyrethroid-only insecticide-treated nets (ITNs) to new-generation nets, evaluating the impact of this shift on malaria transmission and resistance is critical.

Methods: Using the agent-based malaria model, EMOD, we assessed the impact of three ITN types, standard pyrethroid-only nets, pyrethroid-PBO nets (Olyset® Plus/PermaNet® 3.0), and the dual active, Interceptor® G2 nets (IG2) on malaria transmission and the evolution of insecticide resistance. We also evaluated different sequences for introducing the new-generation nets, and the impact of combining ITNs with indoor residual spraying (IRS). The model was calibrated using incidence and prevalence data from two regions in northwestern Tanzania, incorporating seasonality, insecticide resistance, and behaviors of dominant vectors *Anopheles funestus* (highly anthropophilic, endophilic) and *Anopheles arabiensis* (more opportunistic readily biting non-human hosts outdoors).

Results: Changing from standard pyrethroid-only ITNs to pyrethroid-PBO and thereafter to IG2 ITNs reduced homozygous-resistant *An. funestus* and *An. arabiensis* by 62.2% and 92.8%, respectively, and reduced incidence and prevalence by 94% and 75.2% respectively, under conditions where the probability of mosquito pyrethroid resistance was 0.75. Deploying IRS before the peak malaria transmission season in mid-May, in the second year following pyrethroid-PBO ITNs distribution, and repeating this every three years, reduced malaria incidence and prevalence by 76.4% and 52%, respectively.

Conclusion: In contrast to continuous use of standard pyrethroid-only ITNs, which sustains resistance selection, transitioning to new-generation ITNs, with or without periodic IRS, can disrupt the evolutionary trajectory of pyrethroid resistance, reduce malaria burden, and strengthen progress toward elimination.

KEYWORDS: Modelling; Malaria; Insecticide Resistance; Insecticide Treated Bednets

Covariate-driven spatial sampling approach for sampling stations placement using Gaussian random fields, point processes and Voronoi tessellation

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Background: Effective surveillance of *Anopheles* mosquito populations is fundamental to malaria control and elimination, providing the evidence base for monitoring vector density, distribution, and behavioural responses to interventions. Spatial sampling design critically influences both the accuracy and efficiency of surveillance, particularly in landscapes where environmental heterogeneity governs vector abundance. Conventional sampling including simple random, systematic grid-based, stratified, and cluster often perform poorly because mosquito populations are spatially aggregated and environmentally driven. Recent advances in using adaptive spatial sampling have improved the efficiency of mosquito collections by concentrating effort in areas with higher vector densities, thereby enhancing detection of vectors hotspots. However, adaptive approaches introduce increased uncertainty in abundance estimates due to uneven spatial coverage, typically fail to incorporate environmental covariates of mosquito abundance, and perform poorly in low-density settings where insufficient captures make it

difficult to distinguish true vector absence from sampling failure.

Methods: Using two modelling approaches. The first uses Gaussian random fields to represent spatially autocorrelated environmental covariates and generate sampling designs, this employs spatial point processes to produce candidate sampling locations under varying covariate-driven intensity surfaces, enabling the construction of random, regular, and clustered stations. The second uses Voronoi tessellation by partitioning the study area based on covariates of influence.

Results: The results demonstrate that, by explicitly accounting for spatial autocorrelation and environmental drivers of vector distribution these approaches can guide station placement to maximize vector detection probability even in elimination settings where vector density is critically low, rather than distributing sampling effort uniformly across areas that may include locations without vectors an approach that yields excessive zero catches.

Conclusion: This framework can be broadly applicable to any vector surveillance study as it improves sampling efficiency and strengthens vector surveillance systems.

KEYWORDS: Vector ecology

OR-MAL-36

Staged ambient system and semi-field assays demonstrate utility of novel volatile actives for development of second-generation passive emanators to control malaria vectors

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Background: First-generation spatial emanators based largely on pyrethroids such as transfluthrin have demonstrated the ability to reduce human-mosquito contact, but their reliance on a limited set of active ingredients highlights the need for alternative compounds with different modes of action to manage resistance. Second-generation passive emanators therefore requires identification of alternative volatile active ingredients. We applied a staged screening framework combining the Ifakara Ambient Chamber Test (I-ACT) and semi-field system (SFS) to screen candidate compounds for further development.

Methods: Eleven volatile compounds were initially screened in the I-ACT against *Anopheles* mosquitoes using treated filter-paper emanators at multiple doses. Compounds were subsequently evaluated in the modular SFS, and further tested in combination with transfluthrin, and a fixed-ratio combination of IR-trans-chrysanthemic acid (TCA) and GMR-189 was also evaluated. Protective efficacy (PE) was calculated from reductions in blood-feeding relative to concurrent controls.

Results: In the I-ACT, eight compounds achieved $\geq 60\%$ feeding inhibition at one or more doses, with several performing comparably to transfluthrin. However, efficacy generally declined in the SFS, including for transfluthrin, indicating reduced performance under more realistic airflow conditions. Among individual compounds, capric acid and nootkatone retained the highest efficacy against *An. gambiae*, while responses against *An. funestus* were consistently lower. Most combinations with transfluthrin showed limited improvement over single compounds. In contrast, the combination of TCA and GMR-189 achieved the highest protection in the SFS, reaching 70.8% feeding inhibition with low associated mortality.

Conclusion: The staged I-ACT-SFS screening framework efficiently identified volatile active ingredients with potential for passive emanator development. While many compounds showed strong activity in chamber screening, only a subset retained efficacy in semi-field conditions, highlighting the importance of sequential validation. Capric acid, nootkatone, and the TCA-GMR-189 combination emerged as promising candidates for integration into second-generation passive emanators targeting outdoor and peri-domestic mosquito exposure.

KEYWORDS: Second-generation passive emanators; Spatial repellents; Passive emanators; Volatile active ingredients; Ifakara Ambient Chamber Test; Semi-field system; Blood-feeding inhibition

Sublethal Pyriproxyfen Exposure Alters *Anopheles arabiensis* Fitness and Pyrethroid Susceptibility Without Trans-Generational Carry-Over

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Background: Pyriproxyfen (PPF), a juvenile hormone analogue is a promising chemistry for autodissemination strategies, where mosquitoes aid in transferring insecticides to their breeding sites. This study evaluated the effects of sublethal PPF exposure on *Anopheles arabiensis* fitness (fecundity, fertility, and body size) and pyrethroids susceptibility across three generations.

Methods: Laboratory-reared, pyrethroid-resistant mosquito larvae were exposed once to sublethal PPF concentrations of (0.0003, 0.0006, 0.0008, and 0.001 mg a.i./L), that causing emergence inhibition of 5%,10%,15% and 20% respectively, alongside a control group. Emergent adults were tested for susceptibility to 0.75% permethrin, 3.75% permethrin and 0.05% deltamethrin using WHO tube bioassays. Knockdown was recorded at 1 h, mortality at 24 h post-exposure, while fecundity, fertility, and body size were measured across three generations.

Results: First generation mosquitoes exposed to PPF showed reduced susceptibility to 0.75% permethrin and 0.05% deltamethrin ($p < 0.05$), which declined in the second and third generations ($p > 0.05$). Knockdown at one hour was significantly reduced in the first generation following PPF exposure when tested with 0.75% permethrin and 0.05% deltamethrin ($P < 0.001$). However, no significant differences were observed in the second and third generations compared to the control ($P > 0.05$). Notably, 3.75% permethrin resulted in complete knockdown and 100% mortality, regardless of whether mosquitoes emerged from PPF treated or control groups. PPF exposure also significantly reduced fecundity, fertility and body size respectively.

Conclusion: These findings suggest that sublethal PPF doses can temporarily enhance insecticide resistance without leading to heritable resistance and negatively impact key mosquito fitness traits. PPF may thus be a valuable addition to integrated vector management strategies.

KEYWORDS: pyriproxyfen; *Anopheles arabiensis*; autodissemination; pyrethroids; insecticides; sublethal dose; semi-field settings

Contrasting environmental drivers of *Anopheles funestus* and *Anopheles gambiae* larval abundance in Kilombero valley, Tanzania

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Background: Understanding larval ecology of malaria vectors is essential for optimizing larval source management. However, species-specific environmental drivers of larval abundance remain poorly understood, particularly for *Anopheles funestus* and *Anopheles gambiae*, which occupy distinct ecological niches but are rarely compared under natural field conditions. This study quantified habitat characteristics and environmental predictors of larval abundance of both species in the Kilombero Valley, Tanzania.

Methods: A longitudinal grid-based surveillance system covering 62 grids (15×15 km) was implemented, with up to 600 aquatic habitats were characterized and sampled monthly from March 2024 to December 2025. Larvae were collected using standard dippers or 10L buckets, depending on habitat size, and morphologically identified using standard taxonomic keys; *Anopheles funestus* sensu lato and *Anopheles gambiae* sensu lato were included in the analysis. Habitat characteristics were recorded, including physicochemical variables and physical features. Associations between environmental factors and larval abundance were analyzed using negative binomial generalized linear mixed-effects models.

Results: Larval abundance showed contrasting environmental associations between species. For *An. funestus* s.l., abundance increased with higher pH (RR=1.14, $p < 0.001$), vegetation (RR=1.60, $p < 0.001$), algae (RR=1.39, $p < 0.001$), shade (RR=1.24, $p < 0.001$), and slow-moving water (RR=1.73, $p < 0.001$), but decreased with increasing temperature (RR=0.89, $p < 0.001$) and turbidity (RR = 0.32, $p < 0.001$). In contrast, *An. gambiae* s.l. abundance increased with temperature (RR=1.16, $p < 0.001$), temporary habitats (RR=1.24, $p < 0.001$), and turbidity (RR=1.67, $p < 0.001$), but decreased in shaded, vegetated, and algae-rich habitats (RR=0.53–0.85, $p < 0.001$).

Conclusion: These findings demonstrate clear ecological divergence between *Anopheles funestus* s.l. and *Anopheles gambiae* s.l. with distinct environmental conditions associated with larval abundance. The identified habitat characteristics highlight opportunities to refine larval source management by prioritizing habitat types that disproportionately contribute to each species without increasing operational complexity.

KEYWORDS: Larval ecology; malaria vectors and environmental drivers

OR-MAL-39

Phase II experimental hut evaluation of the efficacy and wash resistance of pyrethroid plus PBO and pyrethroid plus Chlorfenapyr mixture bed nets against wild, pyrethroid-resistant Malaria vectors in Tanzania; a non-inferiority assessment.

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Background: The effectiveness of long-lasting insecticidal nets (ITN) is being undermined by the evolution and spread of pyrethroid resistance. This poses a threat to the continued effectiveness of pyrethroid ITNs. New insecticides are required. This study evaluated the efficacy of two new insecticide-treated nets (ITNs): one treated with a combination of alpha-cypermethrin (ACM) and PBO (PBO-X); and another with ACM and CFP (CFP-Y). These were tested against pyrethroid-resistant malaria vectors in Tanzania. The aim was to compare the efficacy of the pyrethroid-PBO and CFP candidate nets with that of a standard pyrethroid-only net.

Methods: This was a Phase II Latin square design non-inferiority efficacy trial, conducted in accordance with WHO guidelines (WHO, 2013; 2018). Laboratory bioassays and field experimental hut collections of mosquitoes were performed. Mosquito mortality, blood-feeding inhibition, personal protection, repellency and insecticide-induced exiting were recorded after zero and 20 washing cycles. The data was analysed using regression and non-parametric tests.

Results: The odds ratio for the difference in mosquito mortality between 20x-washed PBO-X and 20x-washed Olyset Plus was 1.17 (95% confidence interval: 0.74–1.83), while the non-inferiority margin was 0.73. Non-inferiority analysis of mortality after 72 hours for the pooled species (*An. gambiae* and *An. funestus*) showed that the estimated non-inferiority margin for the difference between CFP-Y and Interceptor G2 was 0.75. The odds ratio for the difference in mosquito mortality between unwashed CFP-Y and unwashed Interceptor G2 was 2.1 (CI: 1.3–3.4).

Conclusion: Pooled mortality data for the species *An. gambiae* and *An. funestus* confirmed that 20-times-washed PBO-X was non-inferior to 20-times-washed Olyset Plus. The data also showed that PBO-X was non-inferior to

Olyset Plus, even when the pooled species (*An. gambiae* and *An. funestus*) for pooled washes (unwashed and 20 times washed samples).

KEYWORDS: Malaria vectors; insecticide Treated Nets (ITNs); Public health Intervention Evaluation; Pyrethroid-resistant Malaria vectors; Tanzania.

OR-MAL-40

Susceptibility of *Anopheles* and *Aedes* mosquito populations to pyrethroid insecticide in North Eastern Tanzania

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Background: Insecticide-treated nets and indoor residual spraying are the primary malaria vector control tools in sub-Saharan Africa. However, their effectiveness is increasingly undermined by widespread insecticide resistance in mosquito vectors. The current study assessed the susceptibility of *Anopheles gambiae* complex and *Aedes aegypti* to deltamethrin and permethrin in Tanga, northeastern Tanzania.

Methods: Larvae of the *An. gambiae* complex were collected from rural sites across four district councils: Mkinga, Muheza, Korogwe, and Handeni, while *Ae. aegypti* larvae were sampled from urban and peri-urban locations in Mkata-mashariki, Muheza, Lushoto, and Tanga City. The collected larvae were reared to adult mosquitoes under standard insectary conditions. Two- to five-day-old adults of both species were exposed to 0.05% deltamethrin and 0.75% permethrin, following WHO protocols. Knockdown and 24-hour mortality were recorded. A sub-population of *An. gambiae* complex were analyzed by polymerase chain reaction to identify sibling species and detect knockdown resistance (*kdr*) genes.

Results: *Anopheles gambiae* complex mosquitoes from all five study sites demonstrated resistance to permethrin, with mortality rates ranging from 10.1% to 90.0%. Resistance to deltamethrin was observed in two sites, with mortalities between 67.1% and 92.0%. *Aedes aegypti* populations showed resistance to 0.75% permethrin across all tested sites, and 0.75% deltamethrin resistance in three sites. PCR analysis identified *An. arabiensis* as the dominant sibling species (52%), followed by *An. gambiae* s.s (24%) and *An. merus* (24%). The *Kdr*-East mutation was present across all *An. gambiae* complex sibling species, with allelic frequencies from 1.3%–75% across sites.

Conclusion: The study shows that pyrethroid resistance is widespread in *An. gambiae* complex and *Ae. aegypti* in the surveyed sites. Analysis of sibling species indicated that *An. merus* appeared more abundant and widespread than previously reported. The findings of the *Kdr* analysis suggest that the *An. gambiae* complex population surveyed has multiple resistance mechanisms worth investigating.

KEYWORDS: *Anopheles gambiae* complex; *Aedes aegypti*; insecticide resistance; knockdown resistance; Tanga; Tanzania

OR-MAL-41

Effectiveness of PBO synergist long-lasting nets before and after, the evolution of insecticide resistance in Tanzania: longitudinal meta-analysis experimental hut trials at a single location.

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Background: Long-lasting insecticidal nets (LLIN) for preventing malaria is under threat by selection of pyrethroid resistance. Treatment of the net with the synergist piperonyl butoxide (PBO) is designed to counter malaria transmission by resistant mosquitoes mediated by cytochrome P450 mono-oxygenase mechanisms. The effectiveness of PBO-pyrethroid LLINs were evaluated in a series of experimental hut trials (EHT) before and after the evolution of pyrethroid resistance between 2005 and 2018 in northeast Tanzania.

Methods: PBO-pyrethroid LLIN and standard pyrethroid LLIN were evaluated in EHT for WHO at a sentinel site in East Africa against wild *An. gambiae* and *An. funestus*. Mosquito mortality, blood-feeding and exophily between untreated nets, standard pyrethroid LLINs and PBO-pyrethroid LLINs were compared in each trial using mixed effects logistic regression. Yearly trends between EHT were analysed using meta-analysis. Supplementary bioassay tests assessed natural contact-time, mortality, contact irritability and repellence.

Results: In EHTs, before selection of resistance, wild free-flying *gambiae* and *funestus* killed by standard and PBO LLIN treatments ranged up to 100% mortality overnight. After selection of resistance, there was major reduction in the numbers killed: only 8-18% were killed by Standard LLIN and only 20-26% were killed by PBO LLIN. In the meta-analysis of paired PBO and standard LLINs, mortality relative risk was 1.68 (1.08, 2.62) with *gambiae* and 1.83 (1.05, 3.17) with *funestus*. Repellence was 3 times faster with PBO LLIN compared to Standard LLINs at the mean and 2 times faster at the median point.

Conclusion: There was partial restoration of efficacy in EHT with PBO-pyrethroid LLIN compared to Standard pyrethroid-only LLIN against pyrethroid resistant *An. gambiae* and *funestus*. However, enhanced contact irritancy, repellence and knockdown has a greater role in PBO-pyrethroid mediated efficacy than metabolic mechanisms; this would explain the enhanced personal protection observed with PBO-pyrethroid LLIN against malaria transmission.

KEYWORDS: Keywords long-lasting insecticidal nets; piperonyl butoxide; PBO; insecticide resistance; *An. gambiae*; *An. funestus*; experimental huts; Tanzania

OR-MAL-42

AnoSTEP AfriKa Project: Comprehensive Assessment of the biology and public health importance of *Anopheles stephensi* in Africa

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Background: In the past decade, *Anopheles stephensi* has been reported in Djibouti, Ethiopia, Sudan, Somalia, and, more recently, in Nigeria, Kenya, and Ghana. This invasion has been associated with increased malaria burden in Djibouti and Dire Dawa, Ethiopia. The vector thrives in man-made habitats common in rapidly

urbanizing sub-Saharan Africa, where limited water infrastructure necessitates storage in often uncovered containers, and peri-urban settlements with poor drainage and waste disposal provide conducive environments for its proliferation. This presents a significant threat to already overburdened health systems and threatens gains made in malaria control.

Methods: The study is conducted across diverse geographic settings in Africa to understand the ecological, climatic, and socio-economic factors facilitating the vector's invasion, spread, and establishment. Starting from Djibouti, where the vector was initially detected, the study extends through Ethiopia into Kenya, and includes Nigeria, the first West African country to detect the vector.

Results: Given the large spatial scale of this transect, we will present how an adaptive, model-based longitudinal sampling design that accounts for spatial patterns and ecological diversity was employed in the study areas to optimize *An. stephensi* surveillance. By considering existing models of suitability, rural and urban settings, low, medium, and high malaria transmission settings, transportation routes, and socio-economic factors that may influence the vector's presence. We will provide preliminary findings based on the investigation of the coexistence of *An. stephensi* with native malaria and non-malaria disease vectors in larval habitats, studying its impact on mosquito fitness and population patterns through semi-field and field evaluations.

Conclusion: The AnoSTEP project is expected to facilitate better decision-making and the implementation of vector control strategies, while strengthening the capacity of relevant stakeholders to address emerging threats within Africa's public health landscape.

KEYWORDS: malaria; *An.stephensi*; *stephensi* invasion; Africa

OR-MAL-43

Spatio-temporal modelling of *Anopheles* abundance in Tanga and Unguja, Tanzania, unveiling climatic drivers for malaria early warning and vector control.

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Background: *Anopheles* mosquitoes are highly sensitive to environmental change. As climate alters temperature and precipitation patterns, mosquito populations may shift in sibling species composition, location and timing, altering transmission dynamics. Understanding these patterns is crucial for control. This study links meteorological factors to *Anopheles* abundance in Tanga and Unguja, Tanzania, to predict mosquito peaks and support malaria early warning systems development.

Methods: Adult *Anopheles* mosquitoes were sampled monthly from September/October 2021 to December/September 2023 across 11 sites in Tanga and 4 shehias in Unguja. Spatio-temporal Generalized Additive Mixed Effects Models (GAMMs) were employed to assess the influence of meteorological factors on

Anopheles abundance. Models were built and validated using mosquito counts alongside climate covariates obtained from Copernicus ERA5-Land and NASA's POWER platforms.

Results: A total of 4,312 adult Anopheles mosquitoes were sampled in Tanga and 1,450 in Unguja. The GAMM revealed region-specific climatic drivers. In Tanga, Anopheles abundance increased with higher maximum temperatures but declined with higher minimum temperatures. In Unguja, abundance exhibited a non-linear relationship with mean temperature, peaking below 27.5°C and decreasing thereafter. Precipitation in Tanga positively influenced Anopheles abundance both concurrently and with a two-month lag, whereas in Unguja only the two-month lag effect was significant. Relative humidity exhibited a non-linear effect in both regions, with higher humidity associated with increased abundance. The GAMMs demonstrated strong predictive performance as evidenced by low Mean Absolute Error (MAE) and Root Mean Square Error (RMSE), Theil's U < 1, and correlation exceeding 0.8 between observed and predicted values.

Conclusion: The study highlights the importance of integrating meteorological variability into mosquito surveillance and control. The GAMMs captured weather driven fluctuations in mosquito populations and anticipated the increase in Anopheles abundance preceding the late 2023 Zanzibar malaria outbreak, demonstrating its potential as a scalable early warning proxy for malaria risk and targeted vector control.

KEYWORDS: Anopheles; climate; forecasting; GAMM; malaria; Tanga; Tanzania; Unguja; Zanzibar

OR-NUTR-10

Association Between Malaria Infection and Stunting Among School-Age Children in Tanzania: Evidence from two national cross-sectional surveys (2023-2025)

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Background: School-age children (SAC) are increasingly recognized as an important group in malaria control and nutrition programmes, despite their role as reservoirs of asymptomatic infection and their vulnerability to chronic malnutrition. Evidence on the interaction between malaria and stunting in this population, particularly at national scale and over time, remains limited. This study examined factors associated with malaria infection and stunting, and their potential links to stunting, among SAC in Tanzania using two national surveys.

Methods: We analyzed data from the 2023 (N = 61,655) and 2025 (N = 66,298) Tanzania School Malaria and Parasitological Surveys. Malaria infection was assessed using rapid diagnostic tests, while stunting used standard anthropometric z-scores (height-for-age). Mixed-effects logistic regression, models accounting for school-and council-levels clustering, examined factors associated with malaria and stunting, and their association.

Results: Malaria prevalence declined from 11.2% (95% CI: 11.0 - 11.5) in 2023 to 7.3% (7.1 - 7.5) in 2025, alongside stunting falling from 28.1% (27.8 - 28.5) to 23.5% (23.2 - 23.8). Malaria risk was higher in older children, males, rural residents, and non-users of insecticide-treated nets (ITNs), with marked variation across transmission zones and elevation. Malaria infection was independently associated with increased odds of stunting (AOR 1.13, 95% CI: 1.07 - 1.19), and conversely, stunted children had higher odds of malaria infection, indicating a bidirectional relationship. ITN use and urban residence were protective against malaria. **Conclusions and Recommendation** Despite decline in malaria and stunting, both remain common among SAC in Tanzania, with

persistent socio-demographic and geographic disparities. The observed association between malaria infection and stunting highlights the need for integrated, school-based interventions that address both conditions. Multisectoral, integrated strategies that combine malaria control, nutrition interventions, and social support systems are essential to achieve sustained health gains and break the cycle of infection and undernutrition in this vulnerable population.

KEYWORDS: Malaria; Stunting; School-age children; Public health and insecticide-treated nets

OR-0H-01

Wastewater and Environmental Reservoirs of Extended-Spectrum β -Lactamases and Carbapenemase-Producing *E. coli* and *K. pneumoniae* in Tanzania: Genomic Insights into the Environmental Resistome

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Background: Extended-spectrum β -lactamase (ESBL) and carbapenemase (CPE)-producing Enterobacterales represent a major global public health threat. Genomic characterization of *Escherichia coli* and *Klebsiella pneumoniae* provides insights into antimicrobial resistance (AMR) genes, pathogen diversity and distribution of high-risk clones, supporting effective surveillance.

Objective: To characterize the genomic landscape of ESBL- and carbapenemase-producing *E. coli* and *K. pneumoniae* through wastewater and environment surveillance (WES), and to evaluate the utility of WES for detecting high-risk clones and AMR pattern within a One Health framework.

Methods: From January-December 2025, 160 samples were collected, yielding 98 isolates (74 *E. coli*, 24 *K. pneumoniae*) from clean, surface, sewage, industrial, and groundwater samples across 12 sites in Tanga and Dar es Salaam. ESBL-*E. coli*, ESBL-*Pneumoniae*, CPE-*E. coli*, and CPE-*Pneumoniae*. Species confirmation performed with MALDI-TOF (VITEK MS), Whole Genome sequencing on Illumina MiSeq and data analysis utilizing Bioinformatics to identify antimicrobial resistance genes and sequence types (STs).

Results: We detected ESBL-*Escherichia coli* (20.6%), ESBL-*Klebsiella pneumoniae* (10.0%), CPE-*E. coli* (10.6%), and CPE-*K. pneumoniae* (5.0%), with clinically significant STs, ST410 and ST8 as dominant lineages, alongside ST43, ST535, ST896, ST678, and ST361. Among ESBL genes, blaCTX-M-15 was most prevalent (36%), followed by blaSHV-27 and blaTEM-1B (18%). Carbapenemase genes blaOXA-181 was detected linked to ST410 and blaVIM-2. Additionally, β -lactamase genes included blaSHV-81, blaOXA-1, blaCMY-71, blaDHA-1, blaCTX-M-27, blaCTX-M-3, blaCTX-M-202, blaCTX-M-209, blaCTX-M-216, and blaOKP-12. Important gene ST associations included blaCTX-M-27 in ST131, blaCTX-M-15 in ST8, and blaOXA-181 in ST410, with blaTEM variants distributed across multiple STs. These findings highlight the circulation of multidrug-resistant determinants and suggest potential transmission clusters across environmental reservoirs.

Conclusion: The environmental Resistome profile mirrors clinically relevant AMR patterns, with multidrug-resistant and high-risk clones circulating in the environment. Integrating genomic surveillance into wastewater and environmental monitoring provides early warning system to inform interventions and strengthen AMR control within a One Health framework.

KEYWORDS: Wastewater and Environmental surveillance; antimicrobial resistance (AMR); one Health; Wastewater-based epidemiology

Deciphering colistin resistance among carbapenem resistant Gram-negative bacteria from human, animals and environmental premises in Mwanza, Tanzania: preliminary insights to foster One-Health responsive actions

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Background: Colistin (Polymyxin) antibiotics are reserve antibiotics for the treatment of severe and invasive infections caused by Gram-negative bacteria, and are used as alternative antimicrobial therapeutic options to Carbapenem-resistant Gram-negative bacteria (CarbR-GNB). While colistin is a reserved antibiotic in the human sector, it is widely used as a first line antimicrobial agent in veterinary sector, calling for an urgent need to evaluate the burden of Colistin resistance (ColR) among CarbR-GNB isolates using a One-Health approach to guide holistic and specific interventions.

Methods: A cross-sectional analytical study was conducted in Mwanza city from January to August 2024 involving patients attending Bugando Medical Centre (clinical samples), domestic animals (rectal and cloaca samples) and environmental premises samples (samples from waste water plant and River Mironko). Culture and antimicrobial susceptibility testing were done, and all phenotypically ColR-GNB were subjected to multiplex polymerase chain reaction for eight mobile colistin resistance genes (mcr-1 to mcr-9).

Results: A total of 290 CarbR-GNB isolates were identified across three interfaces [patients (229, 79.0%), domestic animals [livestock (21, 7.2%) and poultry (16, 5.5%)] and environment (24, 8.3%)]. *Acinetobacter baumannii* and *Pseudomonas aeruginosa* CarbR-GNB isolates were predominant in patients, whereas, CarbR *Escherichia coli* was predominant across three interfaces. The overall proportion of ColR among CarbR-GNB was 25.8% (75/290). The distribution of 75 ColR isolates in patients, livestock, poultry and environmental premises were 24.9% (57/229), 33.3% (7/21), 50.0% (8/16), and 12.5% (3/24), respectively, and the ColR was significantly more in poultry (OR: 95% CI = 7.0 (1.2-48.8), p-value=0.01). Multiplex PCR based typeability of mcr genes was 14.7% (11/75).

Conclusion: A quarter of CarbR-GNB isolates in the three interfaces in Mwanza Tanzania expressed ColR co-existence underscoring an urgent need to strengthen One-Health AMR surveillance systems. Multiplex PCR for mcr genes typing was low, calling for more robust molecular typing methods

Wastewater and Environmental Surveillance for Pathogen Detection and Antimicrobial Resistance Gene Profiling in Tanzania.

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Background: Antimicrobial resistance (AMR) poses a significant global and national health threat by undermining antibiotic effectiveness. Pathogens including *Klebsiella pneumoniae*, *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*, frequently cause infections like bloodstream and urinary tract infections with high resistance rates including extended-spectrum beta-lactamase (ESBL) and carbapenem resistance. Tanzania's National Action Plan on Antimicrobial Resistance adopts a One Health approach, however, environmental AMR surveillance is limited. Environmental reservoirs harbor high bacterial densities and residual antibiotics, promoting resistant bacteria growth and horizontal gene transfer. Comprehensive surveillance of these reservoirs is essential to guide interventions against AMR threats.

Methods: The study was implemented in Dar es Salaam and Tanga, focusing on monthly sampling at selected sampling sites for wastewater treatments. Environmental samples comprised of wastewater, clean/drinking water, surface water and groundwater. Samples were collected and analysed according to a developed standardized protocol based on ODIN handbook (10.48060/tghn.154). Bacterial isolates were identified via API20 and MALDI-TOF assays, followed by whole genome sequencing (WGS) on Illumina MiSeq. Data analysis used the Bactopia pipeline for quality control, read mapping, variant calling, multilocus sequence typing (MLST), and screening for AMR genes and virulence factors.

Results: Key microbial genes detected included multidrug efflux transporters (EmrD), acid resistance proteins (Asr), cation-efflux transporters (FieF), and tetracycline efflux transporters (Tet(A)), indicating AMR and stress adaptation mechanisms. Beta-lactam (BL) resistance genes dominated (50–85% of AMR classes across samples), followed by efflux (EFF), phenicol (PHE), and quinolone (10–25%). Aminoglycoside and sulfonamide genes appeared in 10–20% of samples, while trimethoprim (TMP) and tetracycline (TET) showed 10–15% prevalence in specific sites, reflecting environmental variations.

Conclusion: The occurrence of beta-lactam resistance genes alongside distributions of efflux, quinolone, phenicol, aminoglycoside, sulfonamide, trimethoprim, and tetracycline resistance genes underscores significant AMR diversity across wastewater and environmental settings. The data suggest widespread AMR patterns, emphasizing the need for strengthening wastewater and environmental AMR monitoring and integration with clinical surveillance to inform targeted interventions.

KEYWORDS: wastewater surveillance; environmental surveillance; antimicrobial resistance; genomic; public health; bacteria; whole genome sequencing.

OR-TB-02

Use of Tuberculosis Molecular Bacterial Load Assay in sputum samples to characterize tuberculosis treatment response over 12 weeks

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Introduction: Tuberculosis Molecular Bacterial Load Assay (TB-MBLA, LifeArc) quantifies viable *Mycobacterium tuberculosis* (Mtb) RNA and offers a faster readout of treatment response than *Mycobacterial Growth Indicator Tube* time-to-positivity (MGIT-TTP). We characterized treatment response in the SUDOCU and DECODE trials using longitudinal TB-MBLA data and compared it with MGIT-TTP, a gold standard.

Methods: Sputum samples collected weekly over 12 weeks from 148 adults with drug-sensitive pulmonary TB. Participants were randomized to Sutezolid- or Delpazolid-containing regimens (with background bedaquiline, delamanid, and moxifloxacin) or control, were utilized. Batch-specific standard curves converted quantification

cycle values (Cq) to copies-per-reaction (c/rxn). Both TB-MBLA and MGIT-TTP values were log₁₀-transformed. Result: We analyzed 4,864 TB-MBLA measurements of Mtb 16S rRNA (Figure 1). Log₁₀ TB-MBLA showed a moderate negative correlation with log₁₀ MGIT-TTP (Pearson's $r = -0.59$, 95% CI: -0.64 to -0.54). At week 6, 30.6% of TB-MBLA observations were below the limit of detection (LOD of 2.11 log₁₀ c/rxn) compared with 39.5% of MGIT-TTP that had reached the upper LOD (1008 h). By week 12, these proportions increased to 68.8% for TB-MBLA and 95.2% for MGIT-TTP. While MGIT-TTP reaches the LOD earlier and shows a larger proportion of undetectable observations later in the treatment period, TB-MBLA provides a more continuous and quantitative measure of bacterial load and treatment response. Correlations between baseline biomarker values and time to sputum culture conversion (TSCC) were $r = 0.24$ (95% CI: 0.13 to 0.34) for log₁₀ TB-MBLA, and $r = -0.21$ (95% CI: -0.32 to -0.10) for log₁₀ TTP, showing similar strengths.

Conclusion: TB-MBLA aligns with MGIT-TTP while shortening analytical turnaround times, underscoring its utility for monitoring TB treatment response. Ongoing work using non-linear mixed-effects models will further investigate the dynamics of TB-MBLA, the link to MGIT-TTP and clinical outcomes and evaluate performance in drug-exposure-response analysis to support dose optimization.

KEYWORDS: Tuberculosis; Molecular Bacterial Load Assay; treatment response

OR-TB-03

Readiness of Tanzanian Health Facilities to Implement WHO-Recommended Treatment Decision Algorithms for Pediatric Tuberculosis

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Background: Tuberculosis (TB) remains a major public health challenge in sub-Saharan Africa, particularly among children, where diagnosis is complicated by non-specific symptoms and limited diagnostic tools. In Tanzania, a high TB-burden country, delays in diagnosis and treatment contribute to poor outcomes. The World Health Organization (WHO) recommends Treatment Decision Algorithms (TDAs) to improve pediatric TB detection and management. This study assessed the readiness of Tanzanian health facilities to implement WHO-recommended TDAs as part of the formative phase of the OPTIC-TB study.

Methods: A cross-sectional facility-based study was conducted in February 2025 across 40 purposively selected health facilities in Dar es Salaam and Pwani regions. Data were collected using structured questionnaires, key informant interviews, and record reviews. Information on TB diagnostic capacity, treatment services, staffing, data systems, and integration with HIV and nutrition services was obtained. Data sources included TB registers, treatment cards, and facility reports. Descriptive analysis was performed using Stata version 15.

Results: Among the 40 facilities, 67.5% had GeneXpert machines and 97.5% offered TB microscopy, while none had TB-LAM testing. Chest X-ray services were available in 70% of facilities but were often limited by cost. A discrepancy was observed between laboratory registers (43,483 presumptive cases) and TB registers (21,019), suggesting underreporting and missed follow-up. Treatment success rates were low at 46.3% overall, 49.1% among children aged 2-9 years, and 47.0% among those under 2 years. Although over 90% of notified cases received treatment, 15.6% were unevaluated. HIV and malnutrition services were widely available (100% and 92.5%), but staff shortages (67.5%), low motivation (55%), and data challenges persisted.

Conclusion: Tanzanian health facilities demonstrate moderate readiness to implement WHO TDAs. Strengthening diagnostic capacity, workforce training, and data systems is essential to improve guideline adherence, enhance case detection, and optimize pediatric TB outcomes.

KEYWORDS: Pediatric tuberculosis; Treatment Decision Algorithm (TDA); Health system readiness; Diagnostic capacity

Prevalence and determinants of TB among people living with HIV in Tanzania: Evidence from the Tanzania HIV Impact Survey 2022-2023

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Background: Tuberculosis (TB) remains a leading cause of morbidity and mortality globally, disproportionately affecting people living with HIV (PLHIV). Sub-Saharan Africa bears the highest burden, with HIV significantly increasing the risk of progression to active TB. In Tanzania, TB continues to contribute to HIV-related mortality despite advances in prevention and treatment. Although TB preventive therapy (TPT) is effective, challenges in supply, screening, and patient-related factors limit its impact. This study assessed the weighted prevalence of TB and associated factors among PLHIV using Tanzania HIV Impact Survey (THIS) 2022-2023 data.

Objectives: To determine TB prevalence among PLHIV, identify associated factors, and inform improvements in population-based data collection in Tanzania.

Materials and Methods: A cross-sectional secondary analysis was conducted among PLHIV aged 15-80 years with TB status data (n = 217). TB cases were defined based on self-reported diagnosis and completion of treatment. Survey-weighted proportions and prevalence ratios (cPR, aPR) with 95% confidence intervals were estimated using modified Poisson regression with robust variance. Viral load suppression was defined as <1,000 copies/mL.

Results: The mean age was 45.5 years. The weighted TB prevalence was 11.8% (95% CI: 6.9-19.4). Higher prevalence was observed among males and younger participants, though not statistically significant. Secondary or higher education was associated with lower TB risk (aPR = 0.2; p = 0.049). Viral load suppression reduced TB risk (aPR = 0.3; p = 0.016), while lung comorbidities increased risk (aPR = 10.7; p = 0.001). Among those with TPT data, 10.8% developed TB despite IPT use. IPT use and other comorbidities were not significantly associated with TB.

Conclusion: TB risk among PLHIV in Tanzania is influenced by viral suppression, education, and lung comorbidities. Strengthening integrated TB-HIV care, improving viral suppression, expanding TPT, and addressing social and health system barriers are critical to reducing TB burden.

KEYWORDS: Tuberculosis, HIV; People living with HIV, Tuberculosis preventive therapy; Risk factors; Tanzania

Incidence and Predictors of Unfavourable Treatment Outcomes Among Drug-Susceptible Tuberculosis Patients in Dar es Salaam, Tanzania, 2024

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Background: Tuberculosis (TB) remains a major public health problem globally and in Tanzania, with Dar es Salaam bearing a high burden. Despite high treatment success, unfavourable outcomes such as loss to follow-up and treatment failure contribute to ongoing transmission and hinder TB control efforts. Hence, this study aimed to determine the incidence and predictors of unfavourable treatment outcomes among drug-susceptible TB patients in Dar es Salaam in 2024.

Methods: A retrospective cohort study was conducted using the National Tuberculosis and Leprosy Program's Electronic TB and Leprosy (ETL) system. The study included drug-susceptible TB (DS-TB) patients who initiated treatment from January to December 2024. Patients were followed until outcome occurrence or treatment completion. Unfavourable outcomes were defined as death, treatment failure, and loss to follow-up. Incidence rates of unfavourable outcomes were estimated per 1,000 person-months. Kaplan-Meier survival analysis described time to outcome, and Cox proportional hazards regression identified independent predictors of unfavourable outcomes.

Results: Of 14,201 TB cases, 8,874 drug-susceptible TB patients met the inclusion criteria. Most patients were male (65.1%) and aged 15–44 years (56.6%). Overall, 567 (6.3%) experienced unfavourable outcomes, yielding an incidence of 11.74 per 1,000 person-months (95% CI: 10.81–12.75). Incidence was highest in the first two months of treatment (23.64 per 1,000 person-months). Independent predictors included HIV co-infection (aHR 1.42; 95% CI: 1.12–1.79), age ≥ 45 years (aHR 1.47; 95% CI: 1.24–1.75), extrapulmonary TB (aHR 1.29; 95% CI: 1.01–1.64), and receiving care at health centers (aHR 1.83; 95% CI: 1.47–2.28).

Conclusion: Despite high treatment success, a notable proportion of DS-TB patients in Dar es Salaam experienced unfavourable outcomes, predominantly in the early treatment phase. Targeted interventions are essential to improve outcomes and sustain progress toward TB elimination goals, particularly for older adults, HIV-positive patients, extrapulmonary TB cases, and those treated at health centers.

KEYWORDS: Tuberculosis; Treatment outcomes; Survival analysis; Dar es Salaam; Tanzania

OR-TB-06

Implications of pre-diagnosis costs incurred by patients and their families for tuberculosis-related health-seeking behaviors in Mbeya and Songwe regions, Tanzania

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Background: Pulmonary tuberculosis (PTB) remains one of the leading causes of death from infectious diseases worldwide, its burden is disproportionately affecting low- and middle-income countries (LMICs), including Tanzania.

Objective: This study aimed to examine the direct and indirect costs incurred by patients and their families prior to PTB diagnosis, and how such costs influence patients' health-seeking behaviours.

Methods: A mixed-methods approach was employed, integrating qualitative and quantitative methods for data collection, analysis, and interpretation. The study was part of a longitudinal observational cohort that included 261 adults diagnosed with PTB. Quantitative data were collected using a structured questionnaire adapted from the WHO's generic patient cost survey tool, administered after TB diagnosis was confirmed. To gain deeper insights, additional data were gathered through, in-depth interviews (IDIs) with purposively selected participants.

Results: Of the 261 respondents, 59% were men, 48% were married, and 51% were living with HIV, with a median age of 35 years. The majority 185(72.8%) delaying visiting a healthcare facility (HCF) by more than four weeks following the onset of symptoms. The average total pre-treatment cost per patient was USD 28.8, comprising direct medical, direct non-medical, and indirect costs. These costs varied based on the number and type of healthcare providers consulted. Qualitative findings indicated that participants frequently associated this pre-treatment costs with delays in seeking formal care, often influenced by self-medication, limited awareness of TB symptoms, and long distances to formal HCFs.

Conclusion: This study highlights the significant financial and non-financial barriers faces by patients diagnosed with PTB and their families before diagnosis. Delays in care-seeking not only worsen health outcomes but also increase the overall economic burden. Addressing these challenges requires a comprehensive, multisectoral approach to improve early diagnosis, reduce patients costs and strengthen TB control efforts in high-burden settings.

OR-TB-07

Readiness of Healthcare Professionals to Implement WHO Pediatric Tuberculosis Treatment-Decision Algorithms in Tanzania: A Facility-Based Assessment

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Background: Pediatric tuberculosis (TB) contributes significantly to global morbidity and mortality, especially among children under five years. The World Health Organization (WHO) conditionally recommends Treatment Decision Algorithms (TDAs) to support early diagnosis and treatment initiation in children under 10 years with presumptive TB, particularly in resource-limited settings. However, successful implementation depends on healthcare workers' (HCWs) readiness, including knowledge, skills, and training. This study assessed HCWs' training needs, knowledge gaps, and perceptions regarding operational research and TDA implementation under the OPTIC-TB project in Tanzania.

Methods: A cross-sectional, facility-based survey was conducted in February 2025 across 40 public health facilities in Dar es Salaam and Pwani regions, Tanzania. A structured questionnaire was administered to 209 HCWs involved in pediatric TB services. Data on demographics, prior research training, knowledge and skills in operational research, training preferences, and barriers were collected and analyzed using descriptive statistics.

Results: Only 39% of HCWs had received any prior research-related training, with Good Clinical Laboratory Practice (GCLP) being the most common (23.5%). Over 50% reported limited or no knowledge in key areas such as data analysis, report writing, and manuscript development. Highly preferred training topics included implementation science (96%) and human-centered design (27%). Most participants (91%) favored face-to-face training, and 76% preferred bilingual (English and Swahili) instruction. Primary barriers were budget limitations (38%), time constraints (29%), and lack of access to trainers (4%).

Conclusion: Significant training gaps and low research capacity among HCWs may impede effective rollout of WHO TDAs for pediatric TB in Tanzania. Strong interest exists for capacity-building, particularly in practical, interactive, and bilingual formats. Targeted training programs focused on operational research, data literacy, and implementation science should be developed and integrated into existing health systems under the OPTIC-TB project to enhance HCW readiness and support sustainable TDA adoption.

KEYWORDS: Pediatric tuberculosis; treatment decision algorithms; training needs assessment; research capacity; healthcare workers; Tanzania; OPTIC-TB

OR-TB-08

The contribution of Mobile Diagnostic and Treatment Centre (MDTC) in the screening active with their risk factors Tuberculosis in Mbeya and Songwe Region

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Background: Approximately one-quarter of the world's population is estimated to have been infected with TB bacteria. Among those infected, roughly 5–10% will eventually develop active TB disease. Consequently, early detection of tuberculosis cases is critical for prompt treatment initiation, thereby improving treatment outcomes and reducing community transmission, particularly among hard-to-reach populations. This study evaluates the effectiveness of the Mobile Diagnostic and Treatment Centre (MDTC), a community-based active case-finding strategy, in detecting tuberculosis cases among hard-to-reach populations in the Mbeya and Songwe regions in 2024.

Methods: In this community-based study, a cross-sectional design was used to screen for active tuberculosis (TB) cases as well as HIV testing among hard-to-reach populations in the Mbeya and Songwe regions. The screening process consisted of two main steps. First, all individuals who visited the mobile laboratory were assessed for TB symptoms. Second, those who reported symptoms suggestive of TB provided sputum samples, which were then tested for *Mycobacterium tuberculosis* using the GeneXpert real-time PCR assay. Descriptive statistics and measures of association were applied to summarize and analyze the data

Results: A total of 1,620 were screened for TB using MDTC, 1,412(87.2%) could produce sputum for the Xpert TB/RIF testing of which 60 (4.2%) were positive for *M. tuberculosis*. All the sixty Positive TB cases, 60 (100%) were linked to clinics for tuberculosis infection. Males (AOR=3.12, 95% CI 1.72-5.67); $p<0.001$ and age between 25-34 years compared to the age group ≤ 24 -year-old (AOR=3.87, 95% CI 1.25-11.95); $p=0.019$ were associated with the increase of TB case detection and is statistically significant

Conclusions: The study demonstrated that a community-based active case detection strategy using MDTC was effective in identifying cases of *M. tuberculosis* within the community. We should now consider how to sustain and expand this approach on a broader scale using our small budget.

KEYWORDS: Mobile Diagnostic and Treatment Centre (MDTC); Tuberculosis; GeneXpert; Community

OR-TB-09

Person-centred retention strategies for paediatric TB vaccine trial in low resource settings: Lessons from the priMe study

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Introduction: Retention in clinical trials is essential to ensure reliable data on safety and efficacy for advancing health interventions globally. Many trials in low- and middle-income settings face challenges, particularly pediatric trials. Person-centered retention strategies prioritize the needs, preferences, and socio-cultural context of participants and caregivers. We aimed to share experiences of using these strategies to support participant retention.

Methodology: The PRIME TB trial is a phase III clinical trial evaluating the safety and efficacy of a novel tuberculosis (TB) vaccine candidate among neonates. Protection with the available licensed TB vaccine is still highly needed; thus, improved vaccines are required. Due to lengthy follow-up visits necessary to assess safety and efficacy, continued participation is essential but poses retention challenges. This was a descriptive evaluation of person-centered retention strategies implemented within the priMe multicenter pediatric TB vaccine trial. Neonates were enrolled at birth and followed for 36 months. A specialized team was dedicated to tracing and follow-up using home-mapping details collected at enrollment and updated during clinic visits. Weekly in-house trackers showing enrollment and retention trends helped identify missed visits before window closure. Between-visit telephone calls were conducted due to widely spaced visits. Parents and caregivers had access to medical consultation through 24-hour standby calls. Families were invited to periodic birthday events. Community Advisory Board (CAB) meetings were conducted, and local government leaders were involved at every stage.

Results: We enrolled 547 participants; 482 (88.93%) and 467 (85.98%) attended follow-up visits at 12 and 18 months, respectively. Person-centered retention strategies increased participation continuity, reduced missed appointments and dropouts, enhanced participant satisfaction, and improved trust and adherence to the study schedule.

Conclusion: Person-centered retention strategies can significantly improve retention rates and ensure the success of pediatric vaccine trials. Strong community engagement and a good team are essential for retention.

KEYWORDS: Public Health

OR-TB-10

Prevalence, Distribution and Factors Associated with Deaths Among TBat Patients at Dar-Es-Salaam Region, 2024.

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Introduction: Tuberculosis (TB) remains a significant global public health challenge, with Tanzania being one of the 30 high-burden countries, and it was estimated 2018 that 253 new cases of TB were notified. The disease is curable and preventable, yet it still causes a substantial number of deaths, with unknown factors contributing to it by regions. Dar es Salaam, has a high TB notification rate (17%) compared to the rest of the regions, prompting a study to understand the proportion, distribution and factors for deaths among TB patients in the Dar es Salaam region in January to December 2024.

Methodology: An analytic cross-sectional design using secondary data (from DHIS2 ETL) involving TB patients with confirmed diagnosis and who were enrolled for treatment in the Dar es Salaam region during 2024. Age, sex, referral, history of treatment, disease classification, drug regimen, DOT option and HIV status were assessed to identify their association with TB deaths. A total of 9,054 out of 14201 individuals were included in the final analysis after excluding 5147 individuals with a missing outcome variable (death/alive). Descriptive statistics summarized participant characteristics, and chi-square tests and logistic regression identified factors associated with death, presented as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI) and $p < 0.05$.

Results: Among of 9,054 patients, 65.2% were male, and 39.6% were aged 36–59 years. Overall, 4.41% (399) died, predominantly males (61.7%) and those aged ≥ 45 years (49.6%). Risk factors for death included age ≥ 45 years (AOR=4.47, 95% CI: 2.17–9.18, $p < 0.001$), referral from health facilities (AOR=2.90, 95% CI: 2.10–3.99, $p < 0.001$), 2HRZE/10RH regimen (AOR=5.21, 95% CI: 1.50–18.16, $p = 0.01$), and HIV-positive status (AOR=1.27, 95% CI: 1.15–2.70). Pulmonary TB showed lower odds of death (AOR=0.33, 95% CI: 0.13–0.85, $p = 0.021$).

Conclusion: TB mortality in Dar es Salaam is associated with advanced age, referral from health facility's department, 2HRZE/10RH drug regimen, and HIV co-infection. Interventions should focus on early HIV testing and ART initiation, intensified TB–HIV care, close monitoring, adherence support, and strengthening timely referral and clinical management at lower-level facilities, especially for older and HIV-positive patients.

KEYWORDS: TB deaths; Mortality; Dar es salaam; Tanzania.

Validation of targeted nanopore sequencing for drug resistance detection in *Mycobacterium tuberculosis* complex in Tanzania

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Background: Rapid and compressive detection of drug resistance in tuberculosis remains a major challenge in high-burden setting. Portable nanopore MinION devices offer a unique opportunity for near point-of-care detection at relatively low cost. It enables simultaneous detection of *M. tuberculosis* and drug resistance-associated mutations to most of the TB drugs in a single assay. This study aimed to validate performance of nanopore-based targeted next-generation sequencing (tNGS) for the detection of drug resistance in Tanzania.

Methods: A total of 336 samples (176 sputa and 160 culture isolates) routine samples from the Central Tuberculosis Reference Laboratory, were sequenced. DNA extracted by GenoLyse (Hain Life Science) followed by purification with Acetate. Multiplex PCR amplification was then performed, followed by sequencing on MinION Mk1B. Data analysis was performed using wf-tb-amr (v2.0.0-beta.5) workflow on EPI2ME. Results were compared with standard diagnostic methods (phenotypic drug susceptibility testing, (pDST), line probe assays (LPA), and Xpert MTB/RIF Ultra), to determine sensitivity and specificity.

Results: Overall, 73% (247/336) of samples passed quality control. A total of 336 unique samples were sequenced in 21 runs of different batch sizes, where 8(38%) runs failed. 247(73%) of the samples passed quality controls. Also, 18% of samples passed with MTBC had at least one target failed due to insufficient coverage, and 27% failed internal control. Mycobacteria were detected in 335(99.7%) of passed samples, of which 28(11%) were Nontuberculous mycobacteria. Compared to pDST (n=82), tNGS showed sensitivities of 71% for Rifampicin and 64% for Isoniazid with specificities of 85% and 83%, respectively. Agreement with LPA was higher for the drugs, with sensitivity of 87% and specificity of 91%.

Conclusion: This study revealed a promising sensitivity for detecting the key anti-TB drug resistances, especially for Rifampicin and Isoniazid. With further optimization, this approach could provide a viable solution in Tanzania and other resource-limited settings.

KEYWORDS: Nanopore targeted sequencing; Tuberculosis; Drug-resistance detection; Validation; Tanzania

Performance of the TB Molecular Bacterial Load Assay in Low Bacterial Load Tuberculosis Samples

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Introduction: Tuberculosis (TB) remains a global health threat. Molecular tests like GeneXpert improve diagnosis, they cannot differentiate live from dead bacteria, limiting treatment monitoring. Culture methods have low sensitivity in samples with few bacteria. The TB-Molecular Bacterial Load Assay (TB-MBLA), targeting *Mtb* 16S rRNA as a viability marker, shows promise for monitoring treatment but needs validation in low bacterial load

samples.

Methods: 10-fold serial dilutions of Mtb strain from 10^8 to 10^0 CFU/mL to simulate low burden samples, tested using smear microscopy, MGIT and 7H11 culture, GeneXpert MTB/RIF Ultra, and TB-MBLA. The experiment was replicated using sputum samples from pulmonary TB patients. Additionally, we compared mechanical homogenization (magnetic stirrer) alone versus mechanical combined with chemical (NALC) homogenization on Mtb recovery.

Results: TB-MBLA demonstrated strong positive correlation with 7H11 culture ($R^2=0.9689$, $p<0.0001$) for bacterial load quantification. At low bacterial concentrations (10^4 to 10^0 CFU/mL), significant differences emerged between assays: microscopy detected only 25% of samples at 10^4 CFU/mL and was negative below this threshold. GeneXpert detected Mtb in 100% of samples at 10^3 CFU/mL, and 50%, 50%, and 25% at 10^2 , 10^1 , and 10^0 CFU/mL respectively, while TB-MBLA and MGIT detected 50% and 25% at 10^3 CFU/mL. A very strong correlation ($R^2=0.9877$) was observed between GeneXpert and TB-MBLA Ct values. Mechanical homogenization (magnetic stirrer alone) yielded significantly higher bacterial recovery ($2.84 \pm 1.86 \log_{10}$ CFU/mL) compared to mechanical plus chemical homogenization ($1.9 \pm 1.82 \log_{10}$ CFU/mL, $p=0.0313$). GeneXpert MTB/RIF Ultra demonstrates superior sensitivity for detecting Mtb DNA in low burden samples, making it ideal for initial diagnosis. However, TB-MBLA provides essential information on bacterial viability, making it valuable for treatment monitoring.

Conclusion: These assays serve complementary roles in TB management. Optimizing sample homogenization by using mechanical methods alone may improve bacterial recovery for downstream testing.

KEYWORDS: Mycobacterium tuberculosis; TB-MBLA; low bacteria loads

OR-TB-14

Post-TB Lung Disease Among Adults in Tanzania: Evidence from the TB Sequel Cohort

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Background: Post-Tuberculosis Lung Disease (PTLD) is a progressively documented long-term complication among Tuberculosis (TB) survivors, greatly contributing to chronic respiratory morbidity. Despite the high TB burden in Tanzania, statistics on the magnitude and characteristics of PTLD remain restricted. This study aimed to assess the prevalence, patterns, and determinants of PTLD among adults participating in the TB Sequel cohort in Tanzania.

Methods: We performed an analysis on visit 1 data of adults previously treated for pulmonary TB who participated in the TB Sequel cohort in the Southern Highlands of Tanzania. Participants underwent standardized clinical assessments, including spirometry, imaging, and symptom evaluation, consistent with currently recommended diagnostic research criteria for PTLD, during follow-up visits after completion of TB treatment. PTLD was defined based on persistent respiratory symptoms, abnormal lung function, and /or radiological abnormalities consistent with post-TB sequelae. Descriptive statistics were used to estimate the prevalence and patterns of PTLD, whereas logistic regression analyses were conducted to identify associated factors.

Results: A total of 206 TB survivors in the TB sequel cohort were included in the analysis. The prevalence of PTLD was 32%. Spirometry abnormalities were observed in 66 participants, with obstructive (10, 4.8%), restrictive (35, 17%), and mixed (21, 10.2%) patterns recognized. Radiological abnormalities consistent with post-TB impairment, such as Residual cavitation 5 (2.4%), Fibrosis 17 (8.3%), and Bronchiectasis 1 (0.5%), were also observed. Smoking [(AOR=2.25, 95% CI 1.0127-4.981)]; $p=0.046$ and alcohol use [(AOR=0.51, 95%CI 0.264-0.964)]; $P=0.038$ were factors associated with PTLD and were statistically significant.

Conclusion: PTLD embodies a significant but under-recognized health burden among TB survivors in Tanzania. Integrating routine respiratory assessment and long-term follow-up into TB care programs may support early identification and management of PTLD, improving outcomes among TB survivors.

KEYWORDS: TB Sequel Cohort; Post TB Lung Disease; TB survivors; spirometry; Tanzania; Chronic respiratory disease

OR-TRNSF-01

Blood Donor Structure and Transfusion Safety: Five-Year Trends in Voluntary Donation and Transfusion-Transmissible Infections in the Southern Highlands Tanzania

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Background: Voluntary non-remunerated blood donation is the cornerstone of transfusion safety policy, yet donor transfusion-transmissible infection TTI prevalence remains high in many sub-Saharan African settings. We assessed whether donor-pool composition, particularly persistent reliance on first-time donors, helps explain residual TTI risk despite expansion of voluntary donation.

Methods: We conducted a retrospective donor-linked analysis of blood donations collected in Tanzania's Southern Highlands Zone from 2019 to 2023. Two analytic populations were constructed: a donation-level dataset of 174,543 donations for temporal trends, and a donor-year dataset of 169,672 donor-years, in which each donor contributed one observation per calendar year, for donor-level prevalence and multivariable modelling. The primary outcome was any TTI, defined as reactive screening for HIV, hepatitis B surface antigen, hepatitis C virus, or syphilis. Logistic regression examined associations with age, sex, donation type, and year, and tested year-by-donation-type interaction.

Results: Annual donation volume increased from 21,886 in 2019 to 47,173 in 2023, while voluntary donation recovered to 89.6% by 2023. Overall donation-level TTI prevalence was 10.4%, declining from 11.1% in 2019 to 9.5% in 2021, before rising to 10.8% in 2023. Repeat-in-dataset donors remained uncommon, increasing only to 5.5% by 2023. At donor-year level, odds of any TTI were higher in males than females (aOR 1.24, 95% CI 1.19–1.29) and higher in replacement than voluntary donors (aOR 1.43, 95% CI 1.36–1.50). Adjusted odds were lower in 2021 and 2022, but not in 2023; year-by-donation-type interaction was significant ($p < 0.001$). Among first-time TTI-negative donors eligible to return, only 7.3% donated again within the analytic period.

Conclusion: Expansion of voluntary donation was not accompanied by sustained reduction in TTI risk. Donor composition appeared to remain structurally unfavourable, with persistently low repeat-donor representation and higher risk among replacement donors. Strengthening donor retention alongside voluntary recruitment may be important for improving transfusion safety

KEYWORDS: Blood donors; Transfusion-transmissible infections; Voluntary blood donation; Donor retention

PO-AMR-08

Antimicrobial resistance in communicable diseases. A narrative Review of Drivers and surveillance gaps(2015-2025)

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Background: Communicable diseases remain a major global health challenge, causing illness and death worldwide. Diseases like HIV/AIDS, tuberculosis, and malaria put a heavy strain on health systems, especially in low- and middle-income countries. At the same time, antimicrobial resistance (AMR) is a serious threat that reduces the effectiveness of medicines used to treat infections. These resistant pathogens can spread among

humans, animals, and the environment, increasing the risk of hard-to-treat infections.

Methods: This study used a narrative review to analyse literatures and reports on communicable diseases and AMR published between 2015 and 2025. Information was collected from databases such as PubMed, Google Scholar and WHO sources. Key search terms included antimicrobial resistance, communicable diseases. It focused on themes such as antimicrobial use, resistance patterns, infection prevention, surveillance systems, and One Health strategies. Challenges affecting policy implementation, antimicrobial stewardship, and sectoral collaboration were also examined. The data were analysed to identify common themes, challenges and possible solutions.

Results: The review showed that improper use of antimicrobial in humans and animal is a major cause of AMR. Weak regulations, limited data, and poor diagnostic capacity hinder effective monitoring. Poor coordination between health, veterinary, and environmental sectors slows comprehensive AMR control. In 2020, WHO raised alarm about AMR rates, based on reporting data from 78 countries in surveillance report. The world Bank also warned that if AMR is not controlled, it could reduce the global domestic product (GDP) by 1.1% to 3.8% by the year 2050. Emerging technologies like genomic surveillance and rapid diagnostic tests can help in early detection and better management of resistance diseases.

Conclusion: AMR is a serious threat to controlling communicable diseases. Strengthening the One Health approach, improving antimicrobial use, strengthening surveillance systems, investing in better diagnostics, and raising public awareness are essential to reduce AMR and protect global health.

PO-AMR-07

Severe Sepsis Caused by *Chryseobacterium indologenes*: A Multidrug-Resistant Organism: A Case Study, Mbeya, Tanzania

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Background: *Chryseobacterium indologenes* is a yellow-pigmented, Gram-negative, oxidase-positive, non-glucose-fermenting bacterium commonly found in the environment. It is typically considered an opportunistic pathogen associated with hospital-acquired infections. This case demonstrates that it can also cause severe sepsis in otherwise healthy individuals. Notably, *C. indologenes* is known for its resistance to multiple antibiotics.

Methodology: A pus sample was obtained from a patient with severe sepsis of a surgical wound and suspended in a sterile 15 mL Falcon tube containing 0.85% NaCl, then stored at 2–8°C. The sample was inoculated onto Mueller–Hinton agar and blood agar and incubated for 24 hours, after which colony morphology was examined. The organism was identified using Gram staining, oxidase testing, and the API 20NE system. Antimicrobial susceptibility testing was conducted according to standard protocols. Data were analyzed using Microsoft Excel and presented in tables and figures.

Results: Yellow-pigmented colonies were observed on Mueller-Hinton agar, while beta-hemolysis was noted on blood agar. Microscopic examination revealed Gram-negative rods. Biochemical testing showed oxidase positivity, and API 20NE confirmed the organism as *Chryseobacterium indologenes*. Antimicrobial susceptibility testing indicated: Sensitive: Imipenem, Gentamicin, Intermediate: Azithromycin, Resistant: Amoxicillin-clavulanate, Chloramphenicol, Trimethoprim-sulfamethoxazole, Cefepime, Doxycycline, Ceftazidime, Ceftriaxone. **Conclusion and Recommendations:** The results confirm that *Chryseobacterium indologenes* is the causative agent. Among the ten antibiotics tested, only two Imipenem and Gentamicin were effective, one (Azithromycin) demonstrated intermediate activity, and seven showed resistances. These findings underscore the organism's pronounced multidrug resistance. Further molecular characterization of this pathogen is necessary to identify the genes responsible for its multidrug resistance.

KEYWORDS: API 20NE system; antimicrobial susceptibility; API 20NE System

Methicillin-Resistant *Staphylococcus aureus* contamination of high-touch surfaces and devices in obstetric and neonatal units within two hospitals in Tanga, Tanzania: Implications for Infection Prevention and Control

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Background: Methicillin-Resistant *Staphylococcus aureus* (MRSA) is one of the leading causes of healthcare-associated infections (HAIs), particularly in high-risk settings such as the obstetric and neonatal units, including the neonatal intensive care units (NICUs). High-touch surfaces and devices are recognized as potential reservoirs of MRSA transmission, contributing to high neonatal morbidity and mortality. This study aimed to assess the MRSA contamination and their resistance profile in obstetric and neonatal units at two selected Hospitals in Tanzania.

Methods: A cross-sectional study was conducted from April 2022 to March 2023 at the Tanga Regional Referral Hospital (TRRH) and the Korogwe Township Council Hospital (KTCH). Swab samples were collected, bacterial isolation and identification were performed using the standard microbiological techniques, including the Vitek 2 Compact system. The Antimicrobial Susceptibility Testing (AST) was performed according to the European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidelines.

Results: A total of 1,397 swab samples were analysed, of which 9.2% (129/1,397) yielded MRSA from different environmental sources, with most of the isolates recovered from the neonatal ward 64% (83/129). Among surfaces and devices, oximeters were the most contaminated, 27% (9/33), followed by personal/medical devices, 20% (33/166), NICU incubators, 19% (6/32) and thermometers, 18% (6/33). High resistance levels were observed in benzyl penicillin (100%), oxacillin (100%), trimethoprim/sulfamethoxazole (98%), gentamicin and levofloxacin (96%), erythromycin (81%) and clindamycin (80%). No resistance was detected to linezolid, tecoplanin, vancomycin, tigecycline and mupirocin. The inducible clindamycin resistance (iMLSB phenotype) was observed in 74% (95/129) of the isolates.

Conclusion: The study highlights the critical role of the hospital environment as a reservoir for MRSA transmission in critical units. A high level of multidrug resistance, alongside a notable inducible clindamycin resistance, is noteworthy. There is a need to strengthen the infection prevention and control (IPC) measures, including routine decontamination, hand hygiene, and environmental surveillance.

KEYWORDS: MRSA; surfaces; devices; MDR; IPC

Emerging Antimicrobial Resistance among Bloodstream Infections at Tanga Regional Referral hospital and Ngamiani Health Centre: A 2023-2025 Surveillance Study

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Introduction: Antimicrobial resistance poses a serious threat to public health, particularly when diagnostic limitations result in empirical therapy. Bloodstream infections (BSIs) caused by multidrug-resistant bacteria are associated with higher mortality and longer hospital stays. Monitoring local AMR patterns is vital for ensuring appropriate antibiotic use and improving infection control strategies within resource-limited settings.

Methods: A total of 1,196 blood samples were analyzed: 765 from Tanga Regional Referral Hospital and 431 from Ngamiani Health Centre. Bacterial identification and antimicrobial susceptibility testing were performed according to standard microbiological procedures. Isolates were classified as Gram-positive or Gram-negative, and resistance trends were evaluated across major antibiotic classes.

Results: A total of 47 bacterial isolates were identified among 1,196 samples, with 39 (83%) from TRRH and 8 (17%) from Ngamiani. Of these, 68% were Gram-negative and 32% were Gram-positive. The predominant pathogens were *Escherichia coli* (28%), *Klebsiella pneumoniae* (19%), and *Staphylococcus aureus* (15%). Resistance was alarmingly high among β -lactams: 76% of isolates were resistant to at least one agent, specifically ampicillin (81%), ceftriaxone (74%), and cefotaxime (70%). Conversely, carbapenems and aminoglycosides remained effective, showing 85–90% susceptibility. *Staphylococcus aureus* demonstrated 67% resistance to penicillin and erythromycin but remained fully susceptible to vancomycin and clindamycin.

Conclusion & Recommendations: These findings reveal widespread resistance to first-line antibiotics among bloodstream pathogens in the Tanga Region. The high prevalence of resistance to third-generation cephalosporins suggests a critical need to re-evaluate empirical treatment protocols for sepsis. We recommend strengthening antimicrobial stewardship programs and establishing routine microbiological surveillance to track emerging MDR trends. Furthermore, improving laboratory infrastructure at primary health centres is essential for reducing reliance on broad-spectrum antibiotics. Public health interventions should prioritize provider education on rational prescribing and the implementation of stringent infection prevention and control measures to curb the transmission of resistant strains in hospital environments.

KEYWORDS: Antimicrobial resistance

PO-AMR-04

Burden of Communicable Diseases and Antimicrobial Resistance in Tanzania

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Background: Communicable diseases remain a leading cause of morbidity and mortality in Tanzania. At the same time, antimicrobial resistance (AMR) is rapidly increasing, threatening the effective treatment of common infections. The inappropriate use of antibiotics in human medicine, livestock, and community settings accelerates the emergence of resistant pathogens. AMR undermines progress toward Universal Health Coverage (UHC) by increasing treatment costs, prolonging hospital stays, and raising mortality rates. Strengthening surveillance and stewardship is therefore essential to building a resilient health system.

Methods: A retrospective cross-sectional analysis was conducted using laboratory and clinical records from selected health facilities in Tanzania. Antibiotic susceptibility test results from common bacterial isolates were reviewed. Additionally, prescribing practices were assessed to evaluate patterns of antibiotic use. Descriptive statistics were used to summarize resistance patterns and antibiotic utilization trends.

Results: High resistance levels were observed among common pathogens, including *Escherichia coli*, *Staphylococcus aureus*, and *Klebsiella pneumoniae*. Resistance was particularly notable against frequently prescribed antibiotics such as ampicillin, cotrimoxazole, and third-generation cephalosporins. Inconsistent adherence to treatment guidelines and limited diagnostic capacity were identified as contributing factors. Surveillance systems remain fragmented, and antimicrobial stewardship programs are not uniformly implemented across facilities.

Conclusion: Communicable diseases and antimicrobial resistance pose a significant threat to Tanzania's health system and progress toward UHC. Strengthening laboratory capacity, enforcing antibiotic stewardship, improving infection prevention and control measures, and adopting a One Health approach are critical interventions. Addressing AMR is essential for building a resilient health system aligned with Tanzania's Development Vision 2050.

Short Reads Sequence -Based Characterization of Virulence and Antimicrobial Resistance Genes of *Pseudomonas aeruginosa* Clinical Isolates Collected from a Zonal referral hospital, Northern Tanzania

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Background: *Pseudomonas aeruginosa* is among the major causes of nosocomial infections and a WHO critical priority pathogen, showing rising resistance to key antibiotics, including carbapenem. Most studies have relied on phenotypic or targeted PCR methods, which limit comprehensive insights into antimicrobial resistance and virulence. Whole genome sequencing (WGS) has rarely been applied, resulting in limited genomic data from Tanzanian clinical isolates. This study provides WGS analysis of *P. aeruginosa* from a northern Tanzania tertiary care hospital.

Methods: A total of 16 isolates were analyzed, including 12 isolates that were newly sequenced and four with existing sequence data. Bacterial identification used conventional microbiology. WGS was performed on an Illumina NextSeq 550. Species identification was confirmed using KmerFinder v3.2, and antibiotic resistance and virulence genes were identified using abricate v1.0.1. Inter-strain whole-genome single-nucleotide polymorphisms (SNPs), were analyzed with CSI Phylogeny v1.4. Mobile genetic elements were identified using the mobile genetic element finder from the Center for Genomic Epidemiology.

Results: Genome assembled ranged 6.4-6.9 Mbp. All carried core genes (*bla*PAO, *bla*OXA variants, *cat*B7, *fos*A, *aph*(3')-IIb). Acquired genes included *sul*1/2, *aad*A2/6, *ant*(2'')-Ia, *bla*CARB-2, *tet*(G), carbapenemase *bla*DIM-1, and less common reported MDR efflux (*tmex*C3/D3-TOprJ3) were observed. Mobile genetic elements such as insertion sequences and Transposons were observed, with some found alongside resistance genes. Urine isolates had the highest resistance gene prevalence (34.5%). Virulence genes associated with adhesion, secretion, biofilm, and toxins were observed. Phylogeny/MLST revealed heterogeneity, including high-risk ST235.

Conclusion: This study reveals the spread of highly resistant *P. aeruginosa* carrying multiple resistance determinants, virulence factors, and high-risk clones. The findings highlight the need for careful use of antibiotics and strengthen antimicrobial stewardship, and provide genomic insights to guide surveillance, therapy, and infection-control strategies.

KEYWORDS: *Pseudomonas aeruginosa*; antimicrobial resistance genes; virulence and genotypic features; Tanzania

Prevalence and Antimicrobial Resistance Profiles of ESKAPE Pathogens in Clinical Samples from Selected Health Facilities in Tanga City, Tanzania

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Background: ESKAPE pathogens (*Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp.) are major causes of hospital-acquired infections and antimicrobial resistance (AMR). Their increasing resistance limits treatment options and poses a serious public health threat, yet local data from Tanga City are scarce.

Objectives: To determine the prevalence and antimicrobial resistance profiles of ESKAPE pathogens isolated from urine and blood specimens in selected health facilities in Tanga City.

Methods: A cross-sectional study was conducted from May 2023 to October 2025 at Bombo Regional Referral Hospital and Ngamiani Health Centre. A total of 3,460 clinical samples (2,222 urine and 1,238 blood) were processed using standard culture and biochemical identification, including API 20E. Antimicrobial susceptibility testing was performed using the Kirby-Bauer disk diffusion method following EUCAST guidelines.

Results: Of 3,460 samples, 398 (11.5%) were culture-positive, yielding 427 isolates. ESKAPE pathogens accounted for 170 (39.8%) isolates. The most common species were *K. pneumoniae* (31.2%), *S. aureus* (20.6%), *Enterobacter cloacae* (14.1%), *P. aeruginosa* (11.8%), *A. baumannii* (10.0%), and *E. faecium* (6.5%). High resistance was observed to ampicillin (100%), penicillin (96.4%), vancomycin (100%), and cotrimoxazole (85%). Higher susceptibility was noted to amikacin (85%), imipenem (78%), and gentamicin (74%).

Conclusion: A substantial burden of multidrug-resistant ESKAPE pathogens was identified, dominated by *K. pneumoniae* and *S. aureus*. These findings emphasize the need for strengthened AMR surveillance, antibiotic stewardship, and infection prevention strategies to guide empirical therapy and healthcare policy in Tanga City.

PO-AMR-01

Reducing Empirical Antibiotic Prescribing Through Strengthened Diagnostic Stewardship in Malawi's Central Hospitals

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Background: Antimicrobial resistance (AMR) is a major and growing public health threat globally. It is estimated that AMR will be responsible for the loss of 10 million lives by 2050, translating to trillions of dollars in GDP if no urgent action is taken. AMR disproportionately affects low-and-middle income countries and in Malawi, AMR was associated with over 15,000 deaths in 2019. A dual problem exists; excessive empirical prescribing and low laboratory diagnostic uptake, both of which undermine treatment outcomes and accelerate antimicrobial resistance (AMR). Inappropriate antibiotic use is driven by a range of complex factors: behavioral, socioeconomic and systemic, highlighting the need for a holistic approach to improve treatment outcomes and reduce accelerated AMR spread.

Methods: We analyzed data from biannual Global Point Prevalence Surveys (GPPS) conducted in Malawi's four central hospitals during the final quarter of 2024, corresponding to 2,285 in-patients. The survey focused on prescribing practices, antimicrobial use pattern and adherence to treatment guidelines. These findings were triangulated with evidence from a regional systematic review on behavioral and socio-economic determinants of AMR in sub-Saharan Africa to contextualize prescribing practices and diagnostic use.

Results: Of all antibiotic prescriptions recorded, 94% were empirical, with only 5.9% supported by laboratory diagnostics. Ceftriaxone, a WHO Watch category antibiotic, accounted for 38% of prescriptions, indicating substantial reliance on broad-spectrum agents. These trends mirrored regional evidence showing low utilization of microbiological testing, widespread reliance on clinician experience, gaps in AMR knowledge among healthcare workers and continued access to antibiotics without prescription.

Conclusion: Feasible and cost-effective policy options on strengthening diagnostic stewardship through routine culture and sensitivity testing include integrating the use of laboratory diagnostics into routine clinical workflows, reinforcing pharmaceutical regulation on antibiotic dispensation through multidisciplinary coordination and pre- and in-service training on AMR for healthcare staff.

Spatio-temporal trends of antimalarial drug resistance markers in selected regions of Mainland Tanzania from January 2021 to August 2023

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Background: The emergence and spread of antimalarial drug resistance threaten malaria control and elimination efforts. Continuous molecular surveillance is essential to monitor resistance patterns and inform treatment policies, particularly in high-burden countries like Tanzania.

Objective: To assess spatio-temporal trends of molecular markers associated with resistance to artemisinin, partner drugs, and sulphadoxine-pyrimethamine (SP) across selected regions of Mainland Tanzania from January 2021 to August 2023.

Methodology: Data were obtained from the Molecular Surveillance of Malaria in Tanzania (2021–2023). Dried blood spot samples were collected from 13 regions with varying malaria transmission intensities and analyzed using the Illumina MiSeq platform to detect resistance-associated genetic mutations.

Results: The pfk13 R561H mutation showed regional variation, with higher prevalence in Kagera (5.89%) and Kigoma (3.36%) in 2023, and low levels in Manyara (0.6%), Tabora (0.5%), and Njombe (0.4%) in 2021. Within Kagera, Karagwe district recorded the highest prevalence (23.81%) in 2023. No clear temporal increase was observed. The A675V mutation rose slightly from 0.15% in 2021 to 0.68% in 2023, while R622I appeared sporadically, highest in Ruvuma (4.9%) in 2023. For partner drug markers, pfmdr1 Y184F ranged from 38–62% without a consistent trend. D1246Y (~2–5%) and N86Y (<2%) remained low, though D1246Y was slightly higher in Kagera (1.87%). SP resistance markers were highly prevalent, with pfdhfr (N51I, S108N, C59R) and pf dhps (A437G, K540E) exceeding 90%. The pf dhps A581G mutation varied widely, from ~2% in Tabora to 53.78% in Tanga, increasing over time. The pf dhfr I164L mutation declined but remained higher in Kagera (17.03%). Pfcrt mutations remained low (<10%).

Conclusion: SP resistance markers are widespread and nearing fixation, with increasing higher-level resistance. Artemisinin resistance-associated mutations remain rare but show geographic clustering, particularly in Kagera, highlighting the need for continuous, region-specific surveillance to guide malaria control and policy decisions

KEYWORDS: Spatio-temporal trends

Development of the nutri-TB score: A novel composite malnutrition severity assessment tool for adult tuberculosis patients in Dar es Salaam, Tanzania

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Background: Malnutrition affects over half of tuberculosis (TB) patients in sub-Saharan Africa and independently worsens treatment outcomes. Current assessment relies on single anthropometric measures such as Body Mass Index (BMI), which fail to capture the multidimensional nature of TB-related malnutrition. No validated composite nutritional severity tool exists specifically for adult TB patients in high-burden settings.

Objective: To develop and validate the NUTRI-TB Score, a novel 14-point composite malnutrition assessment tool, and compare its diagnostic performance against existing definitions in a large Tanzanian TB cohort.

Methods: We analysed 1,815 adult TB patients enrolled at three facilities in Temeke District, Dar es Salaam (2013–2023). The NUTRI-TB Score integrates seven domains: BMI (0–3), mid-upper arm circumference (MUAC, 0–2), triceps skinfold thickness (0–2), arm muscle area (0–2), weight loss (0–2), clinical signs (0–2), and dietary adequacy (0–1). Discriminative ability was assessed using receiver operating characteristic (ROC) analysis. Multivariable logistic regression adjusted for age, sex, HIV status, smoking, and alcohol use.

Results: Overall malnutrition prevalence (BMI<18.5) was 51.3%. The NUTRI-TB Score achieved an area under the curve (AUC) of 0.932 for severe TB, outperforming BMI (AUC=0.902) and MUAC (AUC=0.904). Each one-point increase conferred an adjusted odds ratio (aOR) of 3.09 (95% CI: 2.63–3.63, $p<0.001$). A dose-response gradient showed 78.1% severe TB in the severe category (score 10–14) versus 0% in the normal category (0–2). HIV-positive patients showed stronger associations (aOR=4.33) than HIV-negative patients (aOR=2.91). A four-tier risk classification identified 8.4% as critical risk.

Conclusion: The NUTRI-TB Score is a practical, multidimensional tool with superior discriminative ability for identifying malnutrition severity and predicting TB outcomes. Its integration into routine TB care could enable targeted nutritional interventions in high-burden Tanzanian settings.

KEYWORDS: tuberculosis; malnutrition; NUTRI-TB Score; nutritional assessment; Tanzania

P0-TB-06

A high centrifugal force-enhanced Ziehl-Neelsen method for improved detection of *Mycobacterium tuberculosis*

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Background: Ziehl-Neelsen (ZN) smear microscopy remains central to tuberculosis (TB) diagnosis and treatment monitoring, yet its sensitivity is limited by incomplete recovery of *Mycobacterium tuberculosis* during pre-analytical processing. This study evaluated whether modifying centrifugation force and duration improves bacillary recovery and ZN smear performance.

Methodology: Laboratory experiments were conducted using *M. tuberculosis* H37Rv strain and pulmonary TB sputum samples. Following N-Acetyl -L- Cystein -Sodium hydroxide (NALC - NaOH) decontamination, samples were centrifuged at 2,000, 3,000, or 6,000 × g for 40 minutes, and the effect of centrifugation time at 3,000 × g was assessed by comparing 20 and 40 minutes using the same specimens. ZN smear grading and positivity were evaluated in triplicate and compared statistically, with significance set at $P < 0.05$.

Results: In H37Rv suspensions, smear grading increased with higher centrifugal force, while smear positivity plateaued at 3,000 × g. In contrast, clinical sputum samples showed progressive increases in both smear grading and positivity with increasing centrifugal force, with statistically significant improvements in positivity ($p = 0.0097$). Extending centrifugation time at 3,000 × g did not change smear positivity in laboratory suspensions or clinical sputum ($P = 0.30$).

Conclusion: These findings indicate that standard centrifugation conditions are sufficient for laboratory strains, whereas higher centrifugal forces enhance bacillary recovery from clinical sputum, improving ZN smear sensitivity. Optimizing relative centrifugal force during pre-analytical processing may therefore reduce false-negative results and strengthen the diagnostic and treatment-monitoring performance of ZN smear microscopy in routine TB laboratories.

PO-MAL-11

Unlike most African settings, *Anopheles gambiae sensu stricto* remain the most abundant malaria vectors in urban areas of Zanzibar

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Background: Persistent malaria transmission despite widespread use of insecticide-treated bed nets remains a challenge for malaria elimination in Zanzibar. A recent malaria surge in urban areas of Zanzibar called for an in-depth exploration of the underlying drivers.

Methods: Larvae sampling was conducted by trained Community-Owned Resource Persons (CORPs). Larval habitat survey using standard dipper in diverse habitat types were conducted from August 2023 to December 2024 in urban areas at Stone town focusing on three shehia namely Malindi, Mnazi Mmoja and Mkunazini which are heavily urbanized and experience repeated surge of malaria cases. Habitat types were classified and summarized to determine species composition, distribution, and relative abundance. Sampled larvae were reared to adult and subjected for molecular analysis to enable malaria vector species identification.

Results: A total of 34 breeding sites were identified and 16 (47%) were found positive for *Anopheles* larvae. The positive breeding habitat types included 37.5% ditch, 18.8% puddles, 12.5% ponds, open drainage 12.5%, concrete tanks 6.3%, water storage containers 6.3%, and sim-tank 6.3%. A total of 395 adult *Anopheles* emerged of them 195 from Mnazimmoja, included *An.gambiae* s.s (n=122) 62.6%, and *An.arabiensis* (n=73) 37.4%. From Malindi 171, included *An.gambiae* s.s (n=108) 63.2%, *An.arabiensis* (n=54), 32%, *An.rufipes* (n=5) 2.9%, and *An.merus* (n=4) 2.3%. From Mkunazini, included 29 *An.gambiae* s.s (n=18) 62.1%, *An.arabiensis* (n=10) 34.5% and *An.merus* (n=1) 3.4%.

Conclusion: Findings show that *Anopheles gambiae* s.s. is the dominant malaria vector across urban shehia of Stone Town, unlike many African cities where *An. arabiensis* prevails. This suggests possible adaptation of *An. gambiae* s.s. to urban environments. Contributing factors may include low ITN use, poor water management, and lack of IRS due to complex housing structures. The presence of breeding sites in artificial containers and drainage systems further supports vector persistence. These findings highlight the need for targeted LSM in urban settings.

KEYWORDS: Surveillance; Malaria; Vector

External Quality Assurance for Mycobacteriology Laboratories: Experience and Performance of the ISO 15189 TB Laboratory Accreditation at NIMR-MMRC, Mbeya, Tanzania

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Background: High-quality diagnostic services are pivotal for tuberculosis (TB) diagnosis, treatment, and control. A strong laboratory quality management system (QMS) is helpful to ensure the quality of testing and reliability of results. The National Institute for Medical Research-Mbeya Medical Research (NIMR-MMRC) TB laboratory attained ISO 15189:2012 accreditation in 2018. The implementation of external quality assurance (EQA) helped achieve key accreditation quality indicators. We evaluated the performance of EQA schemes provided by Integrated Quality Laboratory Services (IQLS) and the United Kingdom National External Quality Assessment Schemes (UKNEQAS).

Objective: To evaluate the performance of EQA panels processed between 2018 and 2025 at the NIMR-MMRC TB research laboratory

Methodology: EQA results from UKNEQAS and IQLS for microscopy, culture, and phenotypic and molecular Drug Susceptibility Testing (DST) performed between 2018 and 2025 were extracted and entered into Microsoft Excel. The EQA results were analyzed cumulatively in GraphPad Prism and compared between quarters and years.

Results: Among 66 UKNEQAS panels, average scores (2018–2025) were 76% (microscopy), 89% (culture), and 84% (Line Probe Assay), with recent 4-year cumulative scores of 0.38, 0.41, and 0.30, respectively, all within acceptable limits (poor performance indicated by >1.96 standard errors below the mean). Concurrently, the 20 IQLS panel averages score (2020–2025) were 95.3% (microscopy), 97.0% (identification), 94.6% (first-line DST), and 96.7% (second-line DST).

Conclusion: These findings confirm the laboratory's strong expertise in tuberculosis testing, evidenced by consistent EQA success over 8 years. We recommend continuous participation in EQA to maintain test quality, ensure compliance with local and international standards, improve tuberculosis (TB) patient care, and build credibility with funders.

KEYWORDS: TB; EQA; QMS; UKNEQAS; IQLS; MICROSCOPY; CULTURE; LPA; Molecular DST; Phenotypic DST

Prevalence of antimalarial drug resistance markers in symptomatic and asymptomatic malaria infections in selected regions of Mainland Tanzania

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Background: In high-transmission settings, asymptomatic *Plasmodium falciparum* infections are often characterized by low-density parasitaemia and occasional gametocytaemia, creating conditions that allow resistance alleles to persist and circulate undetected without active surveillance. This study assessed the prevalence of antimalarial drug resistance markers in *P. falciparum* among symptomatic patients attending health facilities and asymptomatic individuals in the community across five districts in five regions of Mainland Tanzania.

Methods: Dried blood spot samples were collected from 6,113 individuals (2,824 symptomatic and 3,289 asymptomatic) between January and August 2023. DNA extraction was performed using the Tween-Chelex method, followed by sequencing using molecular inversion probes on the Illumina MiSeq platform, with data analysis conducted using the MIPtools protocol. Of the collected samples, 4,335 (80%) were successfully genotyped.

Results: In the health facility survey, the weighted prevalence of the k13 R561H mutation was 7.4% in Kagera and 3.5% in Kigoma. Other k13 mutations (A675V, P441L, R622I) occurred at low prevalence, although R622I reached 7.9% in Ruvuma (HF survey) and 16.7% in Kigoma (community survey). Antifolate resistance markers (dhfr N51I, C59R, S108N; dhps A437G, K540E) were nearly fixed, while dhfr I164L reached 13.7% in Kagera. The dhps A581G mutation varied widely, from 51.5% in Tanga to 66.7% in Kigoma. The pfcr1 K76T mutation showed low to moderate prevalence (6.3%–25.0%), and partner drug resistance remained low except for pfmdr1 Y184F (38.0%–100.0%).

Conclusion: These findings indicate localized emergence of artemisinin partial resistance in northwestern Tanzania and highlight asymptomatic infections as a reservoir for transmission. High antifolate resistance suggests sustained SP pressure, while current ACT efficacy remains supported, underscoring the need for continued molecular surveillance.

KEYWORDS: Malaria; *Plasmodium falciparum*; Asymptomatic infections; symptomatic malaria; artemisinin partial resistance. and Mainland Tanzania

PO-MAL-09

VAC078 Malaria Vaccine Trial in Tanzanian Children: Safety, Follow-Up, and Capacity-Building Outcome

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Background: Phase III malaria vaccine trials in sub-Saharan Africa are essential for evaluating vaccine safety and operational performance across diverse malaria transmission settings. Tanzania is a participating country in this multi-centre consortium trial. This analysis reports implementation outcomes, participant retention, and safety findings from Bagamoyo district.

Objective: To report implementation outcomes, participant retention, and safety findings from the Tanzania sites.

Methods: This was a site-specific analysis of the VAC078 Phase III malaria vaccine trial in Kiwangwa and Miono-Chalinze, Bagamoyo, conducted from September 2021 to March 2023. A total of 711 children were consented and screened; 658 were randomized and 600 received at least one vaccine dose. Participants were followed through vaccination, booster, and extension phases with continuous safety monitoring. Oversight was provided by the sponsor and national regulatory authorities (IHI-IRB, TMDA, NIMR), supported by routine monitoring and an

independent audit to ensure compliance with Good Clinical Practice (GCP).

Results: Of 658 randomized participants, 600 (91.2%) received at least one dose. Completion of the primary series was high: 100% (Dose 1), 96.3% (Dose 2), and 94.5% (Dose 3). Overall, 466 (70.8%) completed the main study. In the extension phase, 513 were re-consented and 499 (97.3%) continued. Booster 2 and Booster 3 were received by 494 and 471 participants, respectively, with 454 completing final follow-up. Attrition was due to consent withdrawal (n=87), loss to follow-up (n=35), and other reasons (n=61). Five discontinued due to adverse events and three due to death. Five major protocol deviations were reported and resolved per GCP. No serious vaccine-related safety signals were identified, and monitoring confirmed good GCP adherence.

Conclusion: The Tanzania sites demonstrate that large-scale Phase III pediatric malaria vaccine trials can be successfully implemented with high uptake, strong retention, and robust safety and regulatory oversight.

KEYWORDS: VAC078; Phase III clinical trial; malaria prevention; pediatric population; trial coordination; capacity building; health systems; Tanzania

PO-CLIM-02

Climate Variability and Malaria Trends in Rural Tanzania: Insights from Health Data, Environmental Records, and Community Narratives

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Background: Tanzania is experiencing increasing climate variability, including changing rainfall patterns and rising temperatures, which may influence malaria transmission. Evidence linking climate variability to malaria trends at local scales remains inconsistent, particularly in areas with ongoing control interventions.

Methods: This study examines whether recent malaria trends in Ifakara can be explained by climate factors alone or by a broader set of environmental and socioeconomic drivers. A mixed-methods design combined retrospective malaria data from 3 health facilities (2018-2024) with rainfall and temperature records from nearby meteorological stations. Quantitative data were analyzed to assess temporal trends and associations between climate variables and malaria cases. Qualitative data were collected from community members and analyzed thematically to explore perceptions of malaria trends and climate variability.

Results: A total of 114,460 patient records were analyzed, with a malaria test positivity rate of 9%. Malaria burden fluctuated from 2018 - 2020, declined sharply in 2021, and remained relatively low from 2022 - 2024 with minor seasonal peaks. Rainfall was highly variable and showed a weak and inconsistent temporal relationship with malaria cases, with occasional increases following periods of higher rainfall, suggesting that rainfall alone does not fully explain the observed trends. Temperature followed typical seasonal patterns but showed no clear association with malaria cases. Qualitative findings indicated a perceived decline in malaria, attributed to improved awareness, increased uptake of preventive measures, and environmental changes, alongside persistent socioeconomic and ecological factors, including poverty and local habitat conditions.

Conclusion: Malaria trends in Ifakara cannot be explained by climate variability alone but reflect a complex interplay of climatic, environmental, and socioeconomic drivers. These findings highlight the need for integrated surveillance approaches that combine environmental, epidemiological, and community-level data to inform adaptive and targeted malaria control strategies.

KEYWORDS: Climate change; Malaria transmission; Climate variability Highlight

Countrywide prevalence of antimalarial drug resistance markers in Mainland Tanzania: A 2023 health facilities-based study

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Background: Malaria case management relies on artemisinin-based combination therapy for uncomplicated *Plasmodium falciparum* malaria and sulfadoxine-pyrimethamine (SP) for intermittent preventive treatment in pregnancy, necessitating continuous surveillance of antimalarial drug resistance markers.

Methods: In 2022, artemisinin partial resistance (ART-R) was confirmed in Tanzania, with high prevalence in Kagera; however, its distribution in other regions remained unclear. This study assessed the prevalence of resistance markers across all 26 regions of Mainland Tanzania using 10,471 positive rapid diagnostic test samples collected in 2023. Samples were sequenced using Illumina MiSeq to detect mutations in *pfk13*, *pfdhfr*, *pfdhps*, *pfcr*, and *pfmdr1* genes.

Results: The *pfk13* R561H mutation was detected in Kagera (7.8%), Katavi (7.9%), and Kigoma (3.4%), while R622I occurred at lower frequencies in Ruvuma, Katavi, Morogoro, and Kagera. Other *pfk13* mutations (A675V, P441I, and P574L) were rare (<1.1%). SP resistance markers (*pfdhfr*/*pfdhps*) were near fixation (>80%) in most regions, although A581G reached 53.8% in Tanga. Mutations in *pfcr* were notably higher in Arusha (>50%) compared to other regions (<12%). In *pfmdr1*, Y184F was the most prevalent mutation (39.1–80.6%) across all regions.

Conclusion: Overall, these findings indicate low but expanding ART-R markers, alongside widespread SP resistance, highlighting the need for continued molecular surveillance to inform malaria treatment and prevention strategies.

KEYWORDS: Malaria; Antimalarial drug resistance; Mainland Tanzania; Artemisinin resistance; *Plasmodium falciparum*; Mainland Tanzania.

Cholera Outbreak Investigation at Kasulu TC in Kigoma Region, Tanzania.

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Background: Cholera is an acute diarrheal illness caused by *Vibrio cholerae* through ingestion of contaminated food or water, leading to severe dehydration and fatality if untreated. In July 2025, a cholera outbreak occurred in the Kigoma Region, with Kasulu TC being most affected. Risk factors include frequent cross-border population movement and nearby refugee camps. This study aimed to investigate the cholera outbreak in Kasulu TC in September 2025.

Methods: A case-control study (1:2 ratio) was conducted during an outbreak. Cholera cases (n=33) had acute watery diarrhoea and were laboratory-confirmed, while controls (n=66) were persons in the same communities who showed no cholera symptoms. Stool samples were tested using RDT and culture, and 12 water samples collected from sources were cultured in MacConkey broth. A logistic regression model was used to identify factors associated with cholera, reporting odds ratios with 95% confidence intervals, with significance at $p < 0.05$.

Results: Two water samples tested positive for *E. coli* and *Klebsiella* spp., indicating contamination. Individuals aged ≤ 30 years accounted for 62% of cases. Risk factors linked with cholera are ingesting food prepared outside the home (aOR=231.54, [CI:10.27-521.97]) compared to that prepared at home, and using a communal washing basin (aOR=14.15 [CI:1.47-135.97]) compared to those not using. Having a functional handwashing facility was

protective (aOR=0.01 [CI: 0.00-0.36]) than those who didn't have one. The availability of toilets (aOR=0.18 [CI: 0.00-9.96]) suggested a protective factor compared to those who don't have toilets.

Conclusion: The cholera outbreak was linked to unsafe food practices and a communal basin. Enhancing WASH is vital to prevent future outbreaks.

KEYWORDS: Epidemiology

PO-CHOL-02

Research Trends and Collaboration Patterns in Diarrhoea Management among Under Five Children in Africa: A Bibliometric Analysis (2000-2025)

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Background: Diarrhoeal disease remains a major cause of morbidity and mortality among children under five in Africa, despite effective preventive and treatment interventions such as water, sanitation and hygiene (WASH), oral rehydration solution (ORS), zinc supplementation, breastfeeding promotion, and rotavirus vaccination. Although research has addressed epidemiology and clinical management, limited bibliometric evidence exists on research productivity, thematic trends, and collaboration patterns across Africa. This study aimed to systematically map and analyze scientific literature on diarrhoea management among under-five children in Africa from 2000 to 2025.

Methods: A bibliometric review was conducted using publications from the Dimensions AI database. Peer-reviewed articles published between 2000 and 2025 focusing on diarrhoea management among under-five children in Africa were included. After screening and data cleaning, 541 publications were analyzed. VOSviewer (version 1.6.20) examined publication trends, journal productivity, authorship and institutional contributions, keyword co-occurrence and international collaboration networks. Descriptive statistics summarized annual publication output and citation patterns.

Results: A total of 541 publications were identified, showing a steady increase in research output, peaking in 2023. Thirteen journals published more than ten articles each, led by PLOS One, Clinical Infectious Diseases, and The American Journal of Tropical Medicine and Hygiene. Co-authorship analysis revealed three major collaboration clusters dominated by North-South partnerships. The Kenya Medical Research Institute, the University of Maryland (Baltimore), and the University of Virginia were the most productive institutions. Key research themes included epidemiology, infections, clinical trials, and intervention strategies, while emerging topics such as antimicrobial resistance, climate influences, and health system challenges were less represented.

Conclusion: Research on diarrhoea management among under-five children in Africa has expanded but remains concentrated in limited regions and themes. Strengthening regional research capacity, promoting equitable collaborations, and expanding focus on emerging and context-specific challenges are essential to inform effective policies and interventions.

KEYWORDS: Diarrhoea; management; Africa; Under-five; children

A phase Ib study to determine the safety and immunogenicity of a bivalent ChAdOx1 vectored vaccine against Zaire and Sudan Ebola virus species in Tanzanian healthy adult volunteers

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Background: Four orthoebolavirus species cause Ebola disease, with Ebola virus (Orthoebolavirus zairense) and Sudan virus (Orthoebolavirus sudanense) responsible for most outbreaks. Currently, no licensed vaccines are available for orthoebolaviruses other than Ebola virus. This study aimed to evaluate the safety and immunogenicity of a non-replicating adenoviral vector vaccine (ChAdOx1 biEBOV) encoding glycoproteins from both Ebola virus and Sudan virus.

Methods: This was a single-centre, open-label, phase 1 dose-escalation clinical trial conducted in healthy Tanzanian adults aged 18–55 years with no significant comorbidities or prior adenovirus vaccine exposure. Participants were enrolled into low-dose (5×10^9 viral particles [vp]), medium-dose (2.5×10^{10} vp), high-dose (5×10^{10} vp), and preferred-dose groups selected based on safety data. Vaccines were administered intramuscularly. A protocol amendment introduced a second dose at 12 weeks in the preferred-dose group. Primary outcomes included solicited adverse events within 7 days, unsolicited adverse events within 28 days, laboratory safety parameters, and serious adverse events throughout the study period. Findings: 48 participants were enrolled across the dose groups. Thirteen (27%) participants reported at least one local adverse event and nine (19%) reported at least one systemic adverse event; all were mild. Two serious adverse events occurred but were unrelated to the vaccine. Unsolicited adverse events were mild to moderate and transient. No adverse events of special interest were observed. Transient mild lymphopenia and neutropenia were observed in the high- and medium-dose groups, respectively. Interpretation: ChAdOx1 biEBOV was safe and well tolerated in healthy Tanzanian adults, supporting further clinical development of this bivalent Ebola and Sudan virus vaccine for outbreak preparedness.

KEYWORDS: Safety; Immunogenicity; vaccine; Zaire; Sudan

Serological evidence of Coxiella burnetii and Brucella species in acute febrile illness in Tanzania

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Background: Brucella spp. and Coxiella burnetii, the causative agents of brucellosis and Q fever, respectively, are important zoonotic pathogens of public health concern. Although human exposure to Brucella has been documented in sub-Saharan Africa, including Tanzania, data on Coxiella, associated risk factors, and co-infection remain limited. This study assessed serological exposure and risk factors in Tanzania.

Methods: All patients meeting the acute febrile illness (AFI) criteria (n=476) were enrolled in a prospective hospital-based epidemiological study, conducted in Dar es Salaam, Mbeya, Arusha, and Kagera, following informed consent. Of these, 285 (59.9%) were analyzed for serological exposure to Q fever and brucellosis. Plasma was isolated from blood samples and tested for Coxiella burnetii and Brucella spp. IgM using Vircell ELISA kits. Sociodemographic characteristics and risk factors were linked to serological results, and statistical analyses

were performed using Stata version 14.

Results: Among 285 patients with acute febrile illness (AFI), 4 (1.4%) tested positive for *Brucella*, while 85 (29.8%) were positive for *Coxiella burnetii*. ii. Seropositivity was higher in females than in males for both pathogens, where in brucellosis, females were 2.0% compared to 0.7% of males, and in *C. burnetii*, females were 36.4% compared to 22.4% in males. Individuals aged ≥ 5 years showed slightly higher *C. burnetii* positivity than those < 5 years (23.1% and 21.4%, respectively). Co-infection was identified in 2 (1.8%) patients aged ≥ 5 years. Recent consumption of animal meat and poultry within 30 days was reported among exposed individuals.

Conclusion: Serological exposure to *Coxiella burnetii* and *Brucella* spp. was detected among AFI patients, with higher risk in females and adults. These results highlight the need for integrated One Health surveillance and population-based seroprevalence studies, considering rural versus urban exposure, to guide diagnostic prioritization and targeted prevention strategies.

KEYWORDS: Acute febrile illness (AFI); *Coxiella burnetii*; *Brucella* spp.; Seroprevalence

PO-AMR-12

Spatio-temporal trends of antimalarial drug resistance markers in selected regions of Mainland Tanzania from January 2021 to August 2023

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Background: Emergence and spread of antimalarial drug resistance threaten malaria control and elimination efforts. In this study, data from the Molecular Surveillance of Malaria in Tanzania project (2021-2023) were used to assess spatio-temporal trends in molecular markers associated with resistance to artemisinin, partner drugs, and sulphadoxine-pyrimethamine (SP).

Methods: Dried blood spot samples were collected from 13 regions with varying transmission intensities and sequenced on Illumina MiSeq platform.

Results: The *pfk13* R561H mutation showed regional variation, with higher prevalence in Kagera (5.89%) and Kigoma (3.36%) in 2023, and was low in Manyara (0.6%), Tabora (0.5%), and Njombe (0.4%) in 2021. No temporal increase was observed, indicating stable prevalence. A675V increased (0.15% in 2021 to 0.68% in 2023); R622I in Njombe (0.3%) in 2021, in Dodoma (1.28%) and Mtwara (0.66%) in 2022, and observed only in Ruvuma (4.9%) in 2023. The *pfmdr1* Y184F allele ranged from 38–62% with regional variation, but no temporal trend. D1246Y (~2–5%) and N86Y (<2%) remained low. There was minimal spatial variation, with slightly higher D1246Y prevalence in Kagera (1.87%), suggesting sustained ACT partner-drug pressure. SP resistance markers, *pfdhfr* (N51I, S108N, C59R >90%) and *pfdhps* (A437G, K540E >90%) mutations remained high and near fixation. *Pfdhps* A581G showed marked spatial variation, from ~2% in Tabora to 53.78% in Tanga, and increased from 12–18% in 2021 to 25–35% in 2023. The *pfdhfr* I164L declined (~8% to ~2%) from ~8% in 2021 to ~2% in 2023. *Pfcrt* mutations stayed low (<10%), with no variations.

Conclusion: These results show that SP resistance is widespread with emerging higher-level resistance. Mutations linked to artemisinin partial resistance are rare but more common in Kagera and are now spreading to other regions. These results support region-specific molecular surveillance to guide control strategies and policy decisions, particularly for emerging drugs such as ganaplacide-lumefantrine.

KEYWORDS: Drug resistance; Malaria; Tanzania; plasmodium falciparum; Mutations

P0-TB-08

Understanding Health Stigma and Discrimination When Accessing TB Care Services During the CUT-TB Study

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Background: Stigma and discrimination related to tuberculosis (TB) remain significant barriers to case detection, diagnostic testing, treatment, and uptake of tuberculosis preventive therapy (TPT), particularly in high-burden settings. The CUT-TB cluster-randomized trial compares universal TB testing with standard symptom-based screening among household.

Objectives: To explore barriers and facilitators, stigma-related experiences and practices, and factors influencing TB case detection and TPT delivery among index patients across Tanzania, South Africa, and Lesotho.

Methods: This descriptive qualitative study employed in-depth interviews (IDIs) using a semi-structured guide informed by the adapted Consolidated Framework for Implementation Research and the Health Stigma and Discrimination Framework. Participants were purposively recruited from the main CUT-TB trial (≥ 20 index TB patients per country; total ≥ 60). Inclusion criteria included microbiologically confirmed drug-sensitive or drug-resistant TB, age ≥ 18 years, enrolment in CUT-TB, and provision of informed consent. Data were analyzed using thematic analysis, incorporating independent coding, development of a master codebook, and both deductive and inductive approaches guided by the study frameworks.

Results: Index patients revealed four consistent themes: (1) outcomes of testing (e.g., knowledge gaps, reactions to diagnosis/testing, TPT awareness); (2) drivers and facilitators of stigma; (3) stigma marking (e.g., perceived stigma, reactions to coughing, TB-poverty intersections, comorbidities, fear of judgment); and (4) health and social impacts (e.g., internalized stigma, adherence strategies, social support, life changes, motivation versus barriers). Secondary (associative) stigma emerged strongly among household contacts. Demographic characteristics showed a balanced gender and age distribution across sites.

Conclusion: stigma persists across individual, interpersonal, and community levels, intersecting with poverty, gender, and comorbidities, and negatively affecting testing, treatment, and TPT uptake. However, reported stigma was relatively low across the three African countries. Disclosure of TB diagnosis was high at enrolment but was not correlated with stigma.

KEYWORDS: Stigma; Discrimination; Index Patients

P0-GBV-01

Prevalence and Determinants of HIV-Related Stigma and Discriminatory Attitudes Among Adults in Tanzania: Evidence from the 2022-2023 Impact Survey

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Background: HIV-related stigma remains a major barrier to equitable access to HIV prevention, testing, treatment, and care services in Tanzania. Despite expanded antiretroviral therapy (ART) coverage, negative attitudes toward people living with HIV (PLHIV) persist. This study assessed the prevalence and determinants of HIV-related stigma among adults using data from the 2022–2023 Tanzania HIV Impact Survey (THIS).

Methods: This was a secondary analysis of nationally representative cross-sectional data from 32,071 adults aged ≥ 15 years across mainland Tanzania and Zanzibar. Stigma was assessed across four domains: internalised, enacted, anticipated, and perceived community stigma, based on UNAIDS indicators. Modified Poisson regression was used to estimate adjusted prevalence ratios (aPRs) with 95% confidence intervals (CIs) for factors associated with stigma.

Results: Overall prevalence of HIV-related stigma was 42.7% (95% CI: 41.3–44.2). Perceived community stigma was the most common (27.7%), followed by anticipated (24.0%), internalised (21.1%), and enacted (17.0%) stigma. Discriminatory attitudes, such as refusal to buy food from HIV-positive vendors, were reported by 24.2% of respondents. Stigma was observed among young adults aged 15–24 years (47.9%) and individuals with no formal education (50.3%). Tanzania mainland and Zanzibar showed prevalence rates of 40.9% and 63.1%, respectively. In multivariable analysis, lower educational attainment (aPR=1.34; 95% CI: 1.22–1.47), non-married status (aPR=1.18; 95% CI: 1.10–1.27), and Zanzibar location (aPR=1.42; 95% CI: 1.30–1.55) were significantly associated stigma. Among people living with HIV, individuals who had not disclosed their HIV status reported higher levels of internalised and anticipated stigma (aPR=1.29; 95% CI: 1.12–1.48), while disclosure to a spouse or family member was associated with reduced internalised and enacted stigma (aPR=0.52; 95% CI: 0.40–0.70).

Conclusion: HIV-related stigma remains widespread in Tanzania, particularly among young people, individuals with lower education, and residents (rural and urban). Interventions should focus on improving HIV literacy, addressing misconceptions, and promoting safe and supportive disclosure environments.

KEYWORDS: HIV-related stigma; discriminatory attitudes; prevalence; determinants; Tanzania

PO-AMR-11

Prevalence and predictors of urinary tract infections in Tanzania: a systematic review and meta-analysis

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Introduction: Urinary tract infections (UTIs) are among the most common bacterial infections worldwide and contribute significantly to morbidity, visits to healthcare, and antibiotic use. In Tanzania, UTIs are commonly reported across different groups; however, existing evidence on their prevalence and associated factors is fragmented, with most of it being facility-based and highly variable across regions and diagnostic methods. This lack of a comprehensive synthesis limits effective prevention strategies, optimisation of diagnostic strategies, and identification of high-risk groups within the health system.

Methods: We conducted a systematic review and meta-analysis of studies published between 2015 and 2025 reporting the prevalence of UTIs and/or associated factors in Tanzania. Random-effects models were used to estimate pooled prevalence, with subgroup analysis and meta-regression applied to explore heterogeneity.

Results: A total of 24 studies involving multiple regions of Tanzania were included in the analysis. The pooled prevalence was 27% (95% CI: 21%–34%), with substantial heterogeneity ($I^2 = 98\%$). Prevalence was highest in Dar es Salaam (40%) and lowest in Kilimanjaro (21%). Children had the lowest pooled prevalence (16%), while older men with benign prostatic hyperplasia or prostate conditions had the highest (46%), with no heterogeneity. Prevalence increased over time, from 19% (2015–2020) to 33% (2021–2025). Meta-regression showed a significantly lower prevalence among children than among adults. Female sex (OR 2.46, 95% CI 1.71–3.53) and

age ≥ 60 years (OR 2.52, 95% CI 1.18–5.37) were associated with higher odds of UTIs.

Conclusion: The study shows that UTIs are among the major public health challenges in Tanzania, with a pooled prevalence of 27% and marked variation across regions, population groups, and time. The burden is higher among women and older adults, particularly men with prostate-related conditions. Strengthening targeted prevention, improving diagnostic capacity, and promoting rational antibiotic use are essential to reduce the burden and associated complications of UTIs

KEYWORDS: Urinary tract infection; Prevalence; Meta-analysis; Risk factors; Tanzania

PO-HIV-01

Factors influencing reported PrEP use when offered as a study drug and non-study drug in a preventive HIV vaccine trial in Mbeya, Tanzania

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Introduction: The PrEPVacc phase IIb HIV vaccine trial enrolled participants likely to be exposed to HIV in Tanzania, South Africa and Uganda. Pre-exposure prophylaxis (PrEP) was provided as a study drug (Descovy or Truvada) for the first 6 months along with vaccines and thereafter, participants were encouraged to continue with non-study PrEP (generic Truvada) accessed at public facilities. In Mbeya, 454 (99%) of 455 enrolled female participants took up study PrEP but only 14 (5%) accessed non-study PrEP. Condomless sex within the last 7 days has been reported by over 88% of participants attending throughout. We assessed factors that might explain the difference in reported PrEP use during the two PrEP phases of the PrEPVacc trial in Mbeya.

Methods: In-depth interviews were conducted from July 2021 to October 2023 with 30 participants at 2, 6 and 12 months of their trial participation. Participants were purposively selected according to study PrEP type (Descovy or Truvada), self-report of adherence and age. Perceptions and experiences of PrEP in the 3 rounds of interviews were compared and analyzed using a framework approach.

Results: Factors that promoted high study-PrEP use were: PrEP being a study drug and awareness that urine was tested for drug presence, understanding that PrEP differs from antiretroviral therapy, perceived high HIV risk, trial team support and confidence in PrEP effectiveness. Low uptake of non-study PrEP was attributed to: choosing to take a break from daily pills, perception of reduced HIV risk, preference for injections over tablets plus negative attitudes towards accessing PrEP from non-study health facilities which are also HIV care and treatment centers.

Conclusion: Alternatives to daily pills that align with client lifestyles and preferences were needed for this population. These may include long-acting injectable PrEP, and diversification of access points other than HIV care and treatment centers.

KEYWORDS: oral PrEP; PrEP uptake; HIV; PrEPVacc trial; Tanzania

PO-MAL-06

Etiological profiling of pediatric febrile illnesses using Metagenomic Next-Generation Sequencing and conventional laboratory Investigations in Bagamoyo, Tanzania.

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Background: As malaria transmission declines across sub-Saharan Africa, non-malarial febrile illnesses now constitute a growing proportion of childhood fever cases. Improved understanding of the clinical epidemiology of

fever in low-transmission settings is critical to guide rational case management and reduce unnecessary antimicrobial use.

Methods: We conducted a prospective cohort study involving 600 children aged 6 months to 10 years in two low malaria transmission sites (Kiwangwa and Fukayosi wards) (parasite prevalence <10%). Participants were followed for sick visits over a 7-month period from July 2023 to February 2024. At each visit, children underwent comprehensive evaluation including clinical assessment, malaria rapid diagnostic test (mRDT), C-reactive protein (CRP), procalcitonin (PCT), complete blood count (CBC), malaria PCR, and metagenomic next-generation sequencing (mNGS) of nasopharyngeal swabs.

Results: The incidence of all-cause sick visits was 1.03 per person-year, with 58.3% (n=158) presenting as fever episodes. Malaria mRDT was positive in 47.5% (75/158) of fever cases. Among RDT-negative cases, 9.3% were still PCR-positive for *P. falciparum*, while 90.7% of RDT-positive cases were PCR-confirmed. Factors associated with malaria RDT positivity included older age (6–10 years; OR 5.0), residence in Kiwangwa ward (OR 5.1), headache (OR 3.3), absence of respiratory symptoms (OR 0.03), thrombocytopenia (OR 11.2), and elevated levels of procalcitonin (OR 14.4) and CRP (OR 4.6). Similar associations were seen using PCR as the gold standard. Among non-malarial fevers, the leading clinical diagnoses were upper respiratory infection (URI; 44.8%) and pneumonia (17.2%). Nasopharyngeal mNGS identified a potential viral etiology in 68.3% of RDT-negative and 22.7% of RDT-positive fever episodes, with Influenza A being the most common virus detected (37.3%). 75.9% of RDT-negative fever cases received antibiotics, predominantly for URI.

Conclusion: Use of malaria PCR, mNGS, and clinical testing in fever surveillance can guide fever case management and strategies to address challenges of emerging pathogens and antimicrobial resistance.

KEYWORDS: Paediatric febrile illness; Metagenomic next-generation sequencing; Low malaria transmission

P0-HIV-02

Co-infection of Herpes Simplex Virus Type-2 with HIV-1 and Syphilis among Women in Mbeya, Tanzania

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Background: Herpes simplex virus type 2 (HSV-2) is a sexually transmitted infection (STIs) that causes genital ulcers and significantly increases the risk of acquiring HIV and Syphilis. However, HSV-2 infection increases the risk of HIV and Syphilis, but data in our region remains limited. We report the sero-prevalence of HSV-2 with HIV and syphilis among high-risk women in the Mbeya region.

Methods: In a retrospective study, we collected data between January 2016 and June 2017 from adult women enrolled in an ongoing study focused on early HIV acquisition in high-risk groups. ELISA was used to detect HSV-2 and HIV antibodies in blood samples. Similarly, Syphilis was tested using Rapid Plasma Reagin and confirmed with *Treponema pallidum* particle agglutination. Data were analysed using Stata software.

Results: Out of 203 women were tested for HSV-2, HIV, and syphilis. Of note, HSV-2 sero-prevalence was 55.6% (113/203), HIV prevalence was 18.2% (37/203), and Syphilis prevalence was 7.4% (15/203). Co-infections were identified as follows: HSV-2/HIV (23.9%), HSV-2/Syphilis (12.4%), and triple infections (3.5%). Only 18.7% women had no detectable levels of three STIs.

Conclusion: Our study found a high burden of HSV-2, HIV, and Syphilis among high-risk women in Mbeya, with a notable proportion experiencing co-infections. These highlight the importance of integrated STI prevention and treatment strategies and further research.

KEYWORDS: Herpes Simplex Virus Type-2; HIV-1 and Syphilis

Assessing the Impact of Settlement Patterns on Malaria Risk in Dar es Salaam, Tanzania

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Background: Malaria remains a major public health challenge in sub-Saharan Africa, with urban transmission increasingly linked to rapid and unplanned urbanisation. In Dar es Salaam, over 70% of residents live in informal settlements characterised by poor housing, high population density, inadequate drainage, and proximity to waterlogged areas sustaining *Anopheles* breeding throughout the year. The influence of urban settlement structure on malaria risk remains poorly understood. This study applies geospatial techniques to examine how residential patterns and environmental conditions correlate with transmission risk across the city.

Methods: Multiple datasets were integrated, including building footprints, road and waterway networks from OpenStreetMap, population data from the National Bureau of Statistics, health facility data from the Health Facility Registry, elevation data from OpenTopography, and modelled malaria prevalence from the Malaria Atlas Project. Building density, distance to waterways, slope, and health facility accessibility were derived and analysed in QGIS using kernel density estimation, proximity analysis, multi-ring buffering, terrain analysis, spatial overlay, and hotspot analysis.

Results: Spatial analysis showed malaria risk is unevenly distributed across the city. Higher risk occurred in densely populated wards, especially near rivers, with poor drainage and high building density. Hotspot analysis identified significant high-risk areas mainly in low-lying informal settlements, while peripheral wards had lower risk. Human population density, proximity to waterways, and settlement type influenced spatial variation.

Conclusion: Settlement patterns strongly influence malaria burden. Informal settlements face higher transmission compared to planned areas. Integrating population, environmental, and health facility data helped explain how urban structure shapes disease distribution. These findings support targeted vector control, better allocation of health resources, and improved urban planning. The approach can also be applied to other rapidly growing cities in sub-Saharan Africa.

KEYWORDS: Malaria risk; settlement patterns; informal settlements; geospatial analysis; Dar es Salaam

Prevalence and Incidence of Advanced HIV Disease in AFRICOS Participants with Viral Non-Suppression

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Background: Advanced HIV disease (AHD) is a risk for people living with HIV (PLHIV) experiencing viral non-suppression (VNS). We determined AHD prevalence at VNS and identified factors associated with incident AHD after VNS amongst PLHIV enrolled in The African Cohort Study (AFRICOS), a multi-country longitudinal study.

Methods: We analyzed data from patient visits conducted every six months (2013-2025) with CD4 count and viral load (VL). VNS was defined as VL > 1000 copies/mL. We calculated the cumulative prevalence of AHD (CD4 < 200 cells/mm³) at VNS events. Multivariable-logistic regression with generalized estimating equations was used to describe factors associated with prevalent AHD.

Results: Among 3438 patients, 47.8% had VNS at least once during the study period. PLHIV were median age 36.2 years and 57.9% female. Across visits where VNS was detected, 29.5% had prevalent AHD. Factors associated with prevalent AHD at VNS included log-VL (aOR = 1.87, 95% CI 1.54 - 2.28), sex (aOR for males vs females = 1.81, 95% CI 1.25 - 2.61), and antiretroviral (ARV) regimen (aOR for protease inhibitors (PI) vs integrase strand transfer inhibitors (INSTI) = 2.23, 95% CI 1.41 - 3.55). For the Cox model, 773 distinct episodes of VNS were identified among 608 patients. Age, viral load, time from HIV diagnosis, and sex did not show significant effects on hazard of incident AHD, but ARV therapy with PI vs INSTI was associated with increased hazard (aHR = 2.89, 95% CI 1.42 - 5.90).

Conclusion: AHD was prevalent at almost a third of visits with VNS. High viral load, PI-based regimens, and male sex were associated with prevalent AHD, while lower CD4 counts and PI-based regimen was associated with progression to AHD after VNS. This work highlights the importance of VNS prevention and factors to consider regarding CD4 testing strategy among PLHIV with VNS.

KEYWORDS: Advanced HIV Disease; HIV; CD4

PO-MAL-10

Post-Exposure Longevity of *Anopheles gambiae sensu lato* mosquitoes to Pyrethroid Insecticides in Three Districts of the Lake Zone, Tanzania

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Introduction: Malaria vectors must survive long enough for the malaria parasite to complete its development, typically within 7–9 days under optimal conditions. Vector control interventions, are designed to reduce mosquito survival and interrupt transmission. However, limited information exists on the longevity of malaria vectors following insecticide exposure. Understanding post-exposure survival is essential for evaluating the effectiveness of current interventions. This study aimed to determine the longevity of *Anopheles* mosquitoes after exposure to commonly used insecticides.

Methods: The study was conducted in four villages across three lake zone districts: Mwisungwi, Kwimba, and Magu in Tanzania between 2021 and 2023. A total of 42 replicates of F1 generation *Anopheles gambiae sensu lato* mosquitoes were exposed to three pyrethroid insecticides. Each replicate consisted of 21–25 mosquitoes exposed for one hour. Knockdown was recorded immediately after exposure, and mortality was assessed at 24 hours following WHO guidelines for assessing mortality. Surviving mosquitoes were monitored daily until death to determine longevity.

Results: Overall, mortality was highest within 24 hours post-exposure across all insecticides. In Igekemaja village, over 80% of exposed mosquitoes died within 24 hours; however, survivors lived up to three weeks,

compared to four weeks in controls. In Ishingisha and Mwagagala villages, exposed mosquitoes did not survive beyond two weeks. Notably, in Mwagagala, mortality following permethrin exposure was below 60%. Although over 90% mortality was observed within 24 hours in some settings, surviving mosquitoes generally lived less than one week. **Conclusion and Policy Implication:** The study demonstrates that while insecticides cause high immediate mortality, a proportion of *An. gambiae* s. l. survive long enough to potentially transmit malaria. Variations in longevity across villages and insecticides suggest emerging insecticide resistance. Malaria control programs should strengthen insecticide resistance monitoring and consider integrating vector control strategies to enhance effectiveness and reduce malaria transmission.

KEYWORDS: *Anopheles gambiae* s.l. mosquitoes; longevity; pyrethroid insecticides; insecticide resistance; malaria transmission; vector control; post-exposure survival; Lake Zone, Tanzania

P0-HIV-04

Evaluation of Performance Characteristics of the Cepheid Xpert® HIV-1 Viral Load XC Assay in Mbeya, Tanzania

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Background: Since 2015, the NIMR-Mbeya laboratory has performed HIV-1 viral load testing using the GeneXpert platform with Cepheid Xpert HIV-1 VL assays. The laboratory has now upgraded to the Xpert HIV-1 VL XC assay, which includes additional primers targeting the pol region to improve detection sensitivity and minimize under-quantification from viral genetic variability. This study evaluated analytical sensitivity, linearity, precision, and accuracy to confirm the assay's suitability for reliable HIV-1 viral load quantification in research settings.

Methods: A laboratory-based experimental study was conducted using 70 HIV-1 positive clinical samples with varying viral loads, alongside HIV-negative (TND) samples and CAP EQA materials (CAP HV2 and LN39 panels). Testing was performed on the Cepheid GeneXpert and Roche Cobas 8800 platforms. Samples ranged from <100 to >10,000 copies/mL. Assay performance was evaluated for analytical sensitivity, linearity, accuracy, calibration verification, and precision.

Results: Precision analysis showed % CVs of 5.75 (intra-assay) and 5.70 (inter-assay) on low viral copies samples and a % CVs of 0.66 (intra-assay) and 1.16 (inter-assay) high viral copies samples. All values met CAP total allowable error criteria ($\pm 10\%$ or 0.25 log copies/mL). Accuracy assessment demonstrated strong correlation ($R^2 > 0.99$). CAP linearity and calibration verification confirmed acceptable performance, while analytical sensitivity was established at 95%.

Conclusion: Our study demonstrates that the Cepheid Xpert® HIV-1 VL XC assay exhibits acceptable precision, with low intra- and inter-assay variability within CAP-specified limits. Accuracy was excellent ($R^2 > 0.99$), and CAP-confirmed linearity and calibration verification ensured reliable quantification across the dynamic range. Analytical sensitivity of 95% supports dependable HIV-1 RNA detection, hence validating the assay for research and clinical monitoring.

KEYWORDS: GeneXpert; HIV-1 viral load; XC assay

P0-TB-01

Determination of Agreement Between DST Results Obtained using MGIT and Molecular test (Xpert® MTB Ultra, MTBDRplus v2, and Xpert XDR Assay)

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Background: To reduce the burden of Tuberculosis (TB), the World Health Organization's (WHO) End TB Strategy requires universal access to Drug Susceptibility Testing (DST) for drug-resistant tuberculosis (DR-TB). In Tanzania, DST is conducted using molecular tests such as GeneXpert MTB/RIF Ultra and GeneXpert XDR, MTBDRplus v2, and Mycobacterial Growth Indicator Tubes (MGIT). However, limited data on the agreement between MGIT and molecular DST highlight the need for this study.

Methodology: A cross-sectional study from May 2025 to June 2026 at the National Institute of Medical Research- Mbeya Medical Research Center (NIMR-MMRC) included 74 GeneXpert Ultra-positive DR-TB suspects from the regions of Mbeya, Songwe, Dar es Salaam, and Njombe. DST was conducted using MGIT 960, GeneXpert MTB/XDR, and MTBDRplus v2. Kappa statistics evaluated the agreement between MGIT and molecular results, with Kappa (κ) values classified as low (<0.4), moderate ($0.4-0.6$), significant ($0.61-0.8$), or perfect ($0.81-1.0$).

Results: Among 74 Mycobacterium tuberculosis isolates, molecular tests (Xpert MTB/RIF Ultra and MTBDRplus) showed strong agreement with phenotypic DST for RIF, with 90.5% concordance and 9.5% discordance ($k = 0.81$, 95% confidence interval 0.58–1.04). Meanwhile, molecular tests (Xpert MTB/XDR and MTBDRplus) demonstrated strong agreement with phenotypic DST for INH, with 90.5% concordance and 9.5% discordance ($k=0.81$, 95% confidence interval 0.59–1.04).

Conclusion: This study demonstrates strong agreement between Xpert/MTB RIF Ultra, Xpert MTB/XDR, and MTBDRplusv2, and phenotypic DST for RIF and INH resistance. Future research should prioritize Myco TB sequencing to clarify 9.5% discordant cases.

KEYWORDS: Concordance; Discordance; Mycobacterium tuberculosis; Rifampicin; Isoniazid; Xpert; MTBDRplus; DST

PO-MAL-01

Participant Retention strategies in a Four-Year Clinical Trial Assessing the Safety and Immunogenicity of the R21/Matrix-M Malaria Vaccine in Kiwangwa and Miono, Tanzania

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Background: Long-term participant retention is crucial for generating reliable data on vaccine safety and immunogenicity. However, maintaining follow-up over several years is often challenging in malaria-endemic settings. This study reports retention outcomes and contributing factors in a four-year clinical trial evaluating the R21/Matrix-M malaria vaccine. Vaccinations began on 02 October 2021 with dose 1, and the final booster was completed on 08 April 2025, covering a total follow-up period of four years.

Methods: A total of 711 participants were screened, 600 participants were enrolled and received dose 1. The vaccination schedule included doses 1–3 administered one month apart, followed by boosters 1–3 administered one year apart. Follow-up included scheduled clinical assessments, safety monitoring, and blood collection. Retention strategies consisted of continuous community engagement, structured follow-up reminders, home visits, transportation support, and regular feedback to participants. Annual retention rates and reasons for withdrawal or missed visits were documented.

Results: Of the 600 participants vaccinated at dose 1, 578 received dose 2, 567 received dose 3, 529 received booster 1, 494 received booster 2, and 471 completed booster 3. A total of 131 participants withdrew during the four-year period. Reasons included 3 deaths, 55 consent withdrawals, 5 adverse events, 21 loss to follow-up, 12 study completions, 2 protocol deviations, and 33 other socio-personal factors (e.g., relocation, divorce). The overall retention rate was 78.2% at the end of the four-year follow-up. Strong community trust, consistent communication, participant-centered visit procedures, and rapid response to participant concerns contributed significantly to sustained retention.

Conclusion: High retention in long-term malaria vaccine trials is achievable through proactive, community-centered approaches. The strong participant retention observed in this study strengthens confidence in the long-term safety and immunogenicity outcomes of the R21/Matrix-M vaccine and provides valuable operational insights for future multi-year clinical trials in similar settings.

KEYWORDS: Immunogenicity; R21/Matrix; Participant retention; Clinical trial; Safety

P0-TB-03

Oxidative stress and lung function in tuberculosis: Opportunities for disease-modifying therapies

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Background: Half of tuberculosis patients are left with permanent lung injury despite microbiologic cure. Host-directed therapies have been proposed to reduce this global health burden. N-acetylcysteine (NAC) has shown promising antimicrobial, antioxidant, and immunomodulatory effects in preclinical tuberculosis models, attributed in part to restoration of cellular glutathione and protection against oxidative damage.

Methods: A clinical trial on NAC in TB study, randomly assigned 140 adults with moderate or far-advanced tuberculosis to standard therapy with or without NAC 1200mg BID for four months. Evaluations included sputum culture, whole blood measures of glutathione, induced cytokines, and haemoglobin. Participants were followed up for six months.

Results: Participants were predominantly young, male, and HIV-1-negative, with heavy sputum MTB infection burdens. Reduced glutathione was significantly lower in patients vs healthy volunteers ($P < .001$). NAC promoted the partial recovery of oxidized and reduced glutathione during days 1–14 (both $P < .05$). Levels of oxidized glutathione remained high relative to controls during NAC treatment but later declined. NAC showed no effect on the HR for stable culture conversion (0.747, 95%CI:0.514–1.085, $P = .125$), or the OR for unsatisfactory outcome (1.808, 95%CI:0.6188–5.2822, $P = 0.279$). Mixed effects modelling showed NAC promoted recovery of FEV1 and FVC, with greatest effects in participants with severe baseline impairments. Effects appeared to persist beyond the period of NAC administration. NAC reduced MTB-induced TNF ($P = .011$) but did not affect IL-10. Anaemia resolved more rapidly in NAC recipients, whereas CRP declined similarly in both arms. Finally, NAC was safe and well-tolerated, with no attributed SAEs or withdrawals. Conclusion and Recommendations, NAC replenished Glutathione levels and reduced TNF production, hence promoted recovery of lung function, particularly in patients with greatest baseline lung impairment. NAC did not affect the eradication of MTB infection, but did restore it. Further studies on NAC dosing and extended follow-up in TB are required.

KEYWORDS: N-Acetylcysteine; Tuberculosis; Host directed Therapies

P0-MAL-02

Mapping Residual Malaria Risk in Low-Transmission Settings: Evidence from the 2025 School Malaria Parasitological Survey in Tanzania

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Background: Malaria transmission in low-endemic regions of Tanzania is highly heterogeneous and often characterized by excess zero-case observations. Conventional models may inadequately capture both zero inflation and spatial dependence, particularly for rare events. This study applies a zero-inflated Bayesian spatial model to characterize ward-level residual malaria risk and its determinants to inform targeted interventions.

Methods: Data were obtained from the 2025 School Malaria Parasitological Survey conducted across seven low-endemic regions (prevalence <5%), including 32,647 children tested and 348 mRDT-confirmed cases aggregated at ward level. A zero-inflated Poisson Besag-York-Mollié 2 (BYM2) model was fitted using Integrated Nested Laplace Approximation (INLA). Covariates included sex, age group, area of residence, distance to the nearest health facility, altitude, rainfall, temperature, slope, and vegetation index. Spatial random effects were modelled using a conditional autoregressive structure, and posterior estimates were exponentiated to obtain relative risks (RR).

Results: Relative risks were below unity across all wards (maximum RR = 0.463), confirming a low-transmission setting with no evidence of elevated risk (RR > 1). However, substantial spatial heterogeneity persisted, with relatively higher risk observed in rural and peri-urban areas. Females had significant lower malaria risk than males (RR = 0.79; 95% CrI: 0.63–0.98). Environmental factors were associated with malaria risk, including rainfall (RR = 1.02; 95% CrI: 1.00–1.05) and temperature (RR = 1.33; 95% CrI: 1.06–1.66), whereas distance to health facilities and slope showed weak or uncertain effects. Altitude demonstrated a non-linear relationship, with increased risk at 750–1250 m (RR = 3.20; 95% CrI: 1.05–10.01).

Conclusion: Zero-inflated Bayesian spatial models effectively capture residual malaria risk in low-endemic settings with excess zeros and spatial dependence. Spatial and environmental heterogeneity underscores the need for geographically targeted surveillance and intervention strategies to support malaria elimination in Tanzania.

KEYWORDS: Malaria; Zero-inflated model; Bayesian modelling; BYM2 model; INLA

P0-TB-05

Stakeholder Perspectives on the Implementation of the WHO Treatment Decision Algorithm for Paediatric Tuberculosis in Tanzania: A Mixed Methods PRISM Study

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Background: Pediatric tuberculosis (TB) diagnosis in Tanzania is hindered by non-specific symptoms and limited diagnostic access. The WHO Treatment Decision Algorithm (TDA) aims to improve diagnosis in children under 10 years, but the feasibility of implementation remains underexplored. This study assessed stakeholder perspectives on TDA implementation across the Tanzanian health system

Methods: A convergent parallel mixed-methods study guided by the PRISM framework was conducted from January to February 2025 across 40 health facilities in Dar es Salaam and Pwani regions, enrolling 199 regional, district, and facility stakeholders. Quantitative data were collected via a structured questionnaire; qualitative data via open-ended questions. Descriptive statistics and thematic analysis were used, with findings mapped across RE-AIM domains.

Results: Stakeholders expressed strong conceptual support for the TDA but identified significant implementation gaps. Confidence in reaching children under ten was high (70% “very likely”), yet substantially lower for rural (52%) and disadvantaged children (54%). Effectiveness was rated highly (76% “very likely”) but depended on health worker training, supervision, and community awareness. Adoption (70–75% “very likely”) required adequate resources at lower-level facilities and integration across child-serving departments. Implementation feasibility (65–67% “very likely”) was constrained by diagnostic supply shortages and staff workload. Sustainability (75–89% “very likely”) hinged on structured follow-up, dedicated personnel, and strong management. Alignment with health systems was strong (74–95% “very likely”) but contingent on diagnostic capacity, medicine availability, and community engagement.

Conclusion: The WHO TDA is acceptable and feasible in Tanzania, but its success requires broader health system strengthening. Key priorities include: (1) decentralizing diagnostics with community-based outreach; (2) institutionalizing TDA training and supervision; (3) ensuring uninterrupted supplies of diagnostics and pediatric TB medicines; and (4) integrating TDA across child health platforms with dedicated staff and monitoring. Without these investments, the TDA’s potential to reduce pediatric TB burden will remain unrealized.

KEYWORDS: Tuberculosis; Pediatric

PO-MAL-03

Malaria knowledge and associated factors towards mosquito net use among schoolchildren in Muheza District, Tanzania

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Background: School-aged children are increasingly recognized as an important reservoir for malaria transmission, yet they remain underrepresented in malaria prevention programs compared with pregnant women and children under five years of age. In Tanzania, insecticide-treated mosquito nets have recently been distributed to primary schoolchildren to strengthen malaria prevention efforts. However, utilization among this population remains inconsistent, and evidence on malaria knowledge and determinants of mosquito net use is limited. This study assessed malaria knowledge and factors associated with mosquito net use among schoolchildren in Muheza District, northeastern Tanzania.

Methodology: A school-based cross-sectional study was conducted from December 2022 to February 2023 among primary schoolchildren in Muheza District. Schoolchildren and household heads were interviewed using structured questionnaires. Malaria knowledge was assessed across transmission, symptoms, treatment, and prevention domains, and children scoring above 50% were categorized as knowledgeable. Information on mosquito net ownership and use the night before the survey was collected. Modified Poisson regression analysis was used to determine factors associated with mosquito net use, with statistical significance set at $p \leq 0.05$.

Results: A total of 530 schoolchildren were enrolled. Among them, 87.2% owned at least one mosquito net, while 69.8% reported using a net the previous night. Overall, 90.6% demonstrated good malaria knowledge. Factors significantly associated with mosquito net use included urban residence, living with parents, and ownership of a television or radio. Household-level determinants included access to electricity, a household size-to-bed-net ratio ≤ 2 , and ownership of mosquito nets that had been used for ≤ 3 years.

Conclusion: Despite high malaria knowledge among schoolchildren in Muheza District, mosquito net utilization remains suboptimal. Strengthening school-based malaria education and addressing household-level barriers are essential to improve consistent mosquito net use and reduce malaria transmission among school-aged children.

KEYWORDS: Malaria knowledge; Mosquito net; schoolchildren; Muheza District; Tanzania

High centrifugation speed improves recovery of *M. tuberculosis* and yield of culture

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Background: TB diagnostics are hampered by pre-and analytic steps. We assessed the impact of centrifugation on recovery of *Mycobacterium tuberculosis* (M.tb).

Methods: In vitro experiments were performed using M. tb, H37Rv strain and real sputum. A 2-weeks M.tb culture from Lowenstein Jensen slope was adjusted to 0.5 McFarland and serially diluted in Middelberook 7H9 broth. Pooled sputum was homogenized for 20 minutes and decontaminated by Following 1/2% N-Acetyl -L-Cystein -Sodium hydroxide (1/2% NALC -NaOH) for 20 minutes. Phosphate Buffer Saline (PBS) was used instead of NaOH for controls. Decontaminated sample and M.tb, H37Rv aliquots were centrifuged at 2000xg, 3000xg and 6000xg for 40 minutes. Pellets were inoculated on *Mycobacterium* Indicator tube (MGIT) and LJ culture media for manual incubation at 37°C. MGIT were incubated into the BACTEC MGIT 960 Systems and positive growth scored following MGIT manual. The data were captured in Microsoft excel and analyzed using GraphPad Prism software.

Results: The positivity (days) for M. tb, H37Rv in MGIT and LJ decreased from 20.4 to 17.7 and from 47.6 to 26.6 at 2000 x g and 6000 x g, respectively; $P > 0.05$. For NALC-PBS (controls), MGIT and LJ positivity (days) decreased from 19 to 10 and from 39.2 to 11.2 at 2000 x g and 6000 x g, respectively; $P > 0.05$. Similarly, MGIT positivity was 6(60%) at 2000xg and 8(80%) at 6000xg, corresponding to mean ($\pm$ SD) of 13.7 ± 6.7 and 9.06 ± 4.6 days, respectively for sputum. LJ positivity was 1(10%) at 2000xg and 7(70%) at 6000xg. Contamination was over 50% in MGIT and 80% in LJ for NALC-PBS processed sputum.

Conclusion: Increasing centrifugation speed may enhance both yield and sensitivity of culture. By optimizing relative centrifugal force, higher recovery of *Mycobacterium tuberculosis* bacilli can be achieved. Specifically, raising centrifugation speed to 6000xg for 40 minutes.

Implementing Multiple First-Line Treatments to Mitigate Artemisinin Resistance in Uncomplicated Malaria: Research Protocol from Pwani, Tanzania

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Background: Tanzania's malaria treatment guideline recommends artemether-lumefantrine (ALU) as first-line therapy for uncomplicated malaria. However, artemisinin partial resistance, confirmed in 2022, threatens ALU efficacy by subjecting partner drugs to prolonged selection pressure. Rotating multiple first-line therapies (MFT) could rescue these partners and curb resistance spread. This protocol describes an implementation-effectiveness study evaluating the feasibility, acceptability, and impact of MFT in the Pwani region, eastern Tanzania

Methods: Conducted across Pwani region's northern (Bagamoyo, Chalinze) and southern (Kibiti, Rufiji) district blocks, the 42-month study divides sites into two clusters, each with one control arm (ALU for 30 months before switching) and two intervention arms rotating Amodiaquine-artesunate or Pyronaridine-artesunate every 12 months for uncomplicated malaria in children and adults. Stratum-specific cycles incorporate varied antimalarials.

Results: End-of-rotation community surveys and qualitative interviews assess MFT perceptions, health-seeking behaviour, service access, and facility utilization. Consented patients provide dry blood spots to measure resistance markers, parasite diversity (days 0/28), and PCR-corrected 28-day cure rates targeting 97% cure rate (95% CI 92%-100%). The National Malaria Control Programme, district pharmacists, and Medical Stores Department will oversee drug deployment, storage and monitoring. Open Data Kit will facilitate real-time data capture with automated transmission to the National Institute for Medical Research for daily cleaning and analysis using Stata/R.

Conclusion: MFT integration into existing national malaria treatment guidelines will transform resistance mitigation, yet evidence on operational feasibility remains scarce. The study findings will inform scalable strategies for Pwani, neighbouring regions, and Tanzania-wide malaria control.

KEYWORDS: Malaria control; Artemisinin partial parasite resistance; Multiple first-line treatment; Pwani; Tanzania

P0-TB-09

Methodological Heterogeneity in Tuberculosis Prevention Trials: A systematic review

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Background: Tuberculosis (TB) remains a significant global public health challenge. The World Health Organization (WHO) End TB Strategy aims to end the global TB pandemic by 2035. Tuberculosis preventive therapy (TPT) and TB vaccines are two key components of the WHO End TB strategy. Over the past two decades, randomized trials have evaluated shorter, safer, and more scalable TPT regimens across diverse populations. TB vaccines have been evaluated and further vaccines are in development. Despite recent advances in TB prevention research, significant methodological challenges remain in the design, analysis, and interpretation of TB prevention trials.

Methods: Systematic review and data synthesis of tuberculosis preventive randomised controlled trials from inception until December 31, 2024. We searched relevant trials from several databases, including PubMed, EMBASE, CENTRAL, Web of Science, WHO International Clinical Trials Registry Platform, conference abstracts, and ClinicalTrials.gov, along with a hand-search of the reference lists of included studies.

Results: The review included 50 TB preventive therapy trials, with the largest proportion conducted among immunocompromised populations (52.0%). Most trials (70%) prioritized incident TB as the primary endpoint. However, death was frequently treated as non-informative censoring rather than appropriately handled as a competing risk. Analytical approaches relied heavily on time-to-event methods, particularly Cox proportional hazards models, despite limited assessment or reporting of the proportional hazards' assumption. Across trials, the observed TB incidence was consistently lower than the incidence assumed in sample size calculations. Additionally, cause-of-death ascertainment was frequently inconsistent or absent, limiting the interpretation of mortality-related outcomes.

Conclusion: TB preventive trials exhibit substantial heterogeneity in estimands, design assumptions, analytical methods, and handling of intercurrent events. Greater adoption of the estimand framework, with explicit handling of intercurrent events and improved alignment between design, analysis, and research objectives, is needed to strengthen the methodological rigor of future trials.

KEYWORDS: Competing risk; TB prevention; Estimand; Intercurrent event

N-Acetylcysteine as a Preventive Strategy for Post-Tuberculosis Lung Disease

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Background: Microbiologic cure of tuberculosis (TB) does not eliminate long-term morbidity. Post-tuberculosis lung disease (PTLD), a complex chronic respiratory impairment that persists despite TB cure, affects a substantial proportion of patients following treatment completion, causing an increase in TB morbidity. N-acetylcysteine (NAC), an antioxidant that replenishes glutathione, may mitigate inflammation and promote lung recovery.

Methods: A prospective follow-up study of participants from the RISE cohort, including a subset previously enrolled in a randomized controlled trial of adjunctive NAC at Kibong'oto Infectious Diseases Hospital, Tanzania. Adult participants completed rifampin-resistant/multidrug-resistant TB treatment between 2020 and 2023 and were reassessed between March and September 2025. A total of 43 participants were included, 20 had received 6 months of NAC during their initial TB treatment (NAC-exposed, 47%) and 23 controls that received TB treatment without NAC (non-NAC, 53%). PTLD was assessed using respiratory questionnaires, pulmonary function testing, chest radiography, and six-minute walk distance. Categorical variables were compared using Chi-square or Fisher's exact test, as appropriate, and continuous variables using Student's t-test. Logistic regression was used to estimate odds ratios for predictors of PTLD. A two-sided p-value <0.05 was considered statistically significant.

Results: Among 43 participants (mean age 48 ± 9 years; 80% male), 20/43 (47%) developed PTLD. PTLD occurred in 6/20 (30%) of NAC-exposed participants compared to 14/23 (61%) of non-NAC controls. Dyspnea and chest pain were the most common symptoms of PTLD, and pulmonary fibrosis was the predominant radiographic abnormality. Not having received NAC was associated with higher odds of PTLD (OR 3.63, 95% CI 1.02–12.94; p = 0.047).

Conclusion: Adjunctive NAC was associated with a reduced risk of PTLD, suggesting a potential protective effect. These findings support a role for oxidative stress and inflammation in the pathogenesis of PTLD. Further studies are needed to define optimal dosing, timing, and underlying biological mechanisms.

KEYWORDS: Post-tuberculosis lung disease (PTLD); N-acetylcysteine (NAC); Kibong'oto Infectious Diseases Hospital; Tanzania

The Hidden Asymptomatic Malaria Reservoir Among School-Aged Children in Tanzania: Age, Sex and Spatial Heterogeneity Across Councils

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Introduction: School-aged children (SAC, 5–16 years) bear a disproportionate yet largely unaddressed malaria burden in Tanzania, acting as a major asymptomatic reservoir sustaining transmission. In routine practice, fever is the primary trigger for care-seeking and malaria testing at health facilities, meaning infections without fever often remain undetected. This study assesses the distribution and burden of asymptomatic malaria across age, sex and their spatial heterogeneity.

Methods: A nationally representative survey of 64,033 SAC who were tested for fever in 2023 was analyzed. Malaria infection was detected using rapid diagnostic tests. Symptomatic malaria was defined as RDT-positive

with measured body temperature $\geq 37.5^{\circ}\text{C}$, asymptomatic malaria as RDT-positive without fever. Prevalence was estimated by symptom status, age, and sex, and spatial analysis characterized council-level heterogeneity.

Results: Overall malaria prevalence was 11.2%, of which 9.6% were asymptomatic and 1.5% symptomatic infections. Among malaria-positive children, 86.2% were asymptomatic while 13.8% were symptomatic. Males consistently showed higher asymptomatic prevalence than females across all age groups, and prevalence increased with age, peaking among adolescents (13–16 years). Council-level analysis revealed marked heterogeneity, some councils carried a dual burden of both infection types, others were dominated by asymptomatic infections alone, while a few showed predominantly symptomatic malaria or higher symptomatic than asymptomatic malaria.

Conclusion: Asymptomatic malaria constitutes the majority of infections among SAC in Tanzania, representing a substantial, undetected reservoir with implications for anemia, cognitive impairment, and ongoing transmission. These findings underscore the need for targeted, stratified interventions. Integrating SAC into malaria control through school-based screening, treatment, vector control, and WHO-recommended Intermittent Preventive Treatment in schoolchildren (IPTsc) is critical to reduce transmission and advance Tanzania's 2030 elimination goals.

KEYWORDS: malaria; asymptomatic; epidemiology; School-Aged Children; Tanzania

PO-AMR-10

Laboratory-Based Surveillance of Antimicrobial Resistance in Urinary Tract Pathogens at Bombo Regional Referral Hospital, Tanga Region

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Background: Antimicrobial resistance (AMR) is a growing global public health threat that compromises the effective treatment of common infections, including urinary tract infections (UTIs). UTIs are among the most frequently reported bacterial infections in healthcare settings, and increasing resistance among uropathogens limits available treatment options. Laboratory-based surveillance plays a crucial role in generating reliable data to monitor antimicrobial resistance trends and inform antibiotic stewardship programs. This study aimed to determine the distribution of bacterial pathogens and their antimicrobial resistance patterns among urine samples collected through routine surveillance.

Methods: A cross-sectional study was conducted using 790 urine samples collected as part of routine AMR surveillance at a regional referral hospital. Samples were cultured using standard bacteriological methods, and bacterial isolates were identified through routine microbiological techniques. Antimicrobial susceptibility testing was performed using the Kirby-Bauer disk diffusion method following European Committee on Antimicrobial Susceptibility Testing (EUCAST) guidelines. Data were analyzed to determine the prevalence of bacterial isolates and their resistance profiles against commonly used antibiotics.

Results: Out of the 790 urine samples analyzed, 147 (18.6%) showed significant bacterial growth. The most frequently isolated pathogens were *Escherichia coli* (42.2%), *Klebsiella pneumoniae* (17.7%), *Enterococcus faecalis* (14.3%), and *Pseudomonas aeruginosa* (8.8%). Gram-negative isolates demonstrated high resistance to several commonly prescribed antibiotics, including cotrimoxazole (90%), cefepime (70.8%), and ciprofloxacin (77.1%). In contrast, lower resistance rates were observed for nitrofurantoin (5.7%) and meropenem (8.2%). Among Gram-positive isolates, notable resistance was observed to erythromycin (100%), vancomycin (42.9%), and imipenem (50%), indicating emerging therapeutic challenges.

Conclusion: The high resistance observed among common uropathogens, particularly *E. coli* and *K. pneumoniae*, highlights the growing challenge in the management of UTIs. Nitrofurantoin and meropenem remain relatively effective treatment options. Strengthening routine AMR surveillance and promoting rational antibiotic use are essential for evidence-based clinical management and improved public health interventions.

KEYWORDS: Antimicrobial Resistance; Urinary Tract Infections; Tanzania

Health Systems Strengthening for UHC and National Health Security

56 Abstract(s)

OR-AMR-13

Prevalence of Multidrug-Resistant Salmonella Typhi Isolated from Blood Samples at Selected Health Facilities in Korogwe District, Tanga

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Introduction: Enteric fever is a significant health problem in developing countries caused by Salmonella enterica serovar Typhi. Antibiotics are the primary treatment for typhoid fever; however, the emergence and spread of multidrug-resistant (MDR) Salmonella Typhi have reduced their effectiveness. Multidrug resistance poses a significant challenge to the successful treatment of typhoid fever, resulting in social, economic, and health burdens. This study was conducted to assess the prevalence of MDR Salmonella Typhi in blood samples.

Methodology: A cross-sectional study employing descriptive data analysis was conducted in Korogwe District, involving Korogwe Town Council Hospital and Majengo Health Care Centre. A total of 364 blood samples were collected from patients with suspected septicemia, including 49 from adults and 315 from children. Blood cultures were processed using the BD BACTEC FX40 automated system. Positive cultures were subcultured on standard media, and identification of Salmonella Typhi was performed using a Salmonella agglutination test kit and API 20E system. Confirmation and antimicrobial susceptibility testing were conducted using the VITEK 2 Compact system.

Results: Out of 364 blood samples, 21 (5.8%) yielded bacterial growth. Among these isolates, 14 (66.7%) were identified as Salmonella Typhi. Of the Salmonella Typhi isolates, 13 (92.9%) were from children and 1 (7.1%) from an adult. Overall, Salmonella Typhi accounted for 3.8% (14/364) of all suspected septicemia cases. Among the Salmonella Typhi isolates, 12 (85.7%) were multidrug-resistant. The MDR isolates showed resistance to ampicillin, ampicillin-sulbactam, chloramphenicol, and trimethoprim-sulfamethoxazole. Children under 8 years of age were the most affected group.

Conclusion: This study demonstrates a high prevalence of multidrug-resistant Salmonella Typhi, particularly among pediatric patients in Korogwe District. These findings highlight the need for strengthened antimicrobial stewardship, infection prevention and control measures, and continuous surveillance. Further studies are recommended to investigate the genetic determinants of antimicrobial resistance in Salmonella Typhi.

KEYWORDS: Salmonella Typhi; Multidrug-Resistant (MDR); Prevalence

OR-CD-08

Targeted next-generation sequencing reveals broad bacterial and viral respiratory pathogens diversity within Tanzania's ILI/SARI surveillance system

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Background: Acute Respiratory Infections (ARI) remain among the leading causes of morbidity and mortality in Tanzania, yet routine Influenza-like Infection and Severe Acute Respiratory Infection (ILI/SARI) surveillance relies on real-time quantitative Polymerase Chain Reaction (qPCR) assays targeting a limited range of viral pathogens, leaving many cases without confirmed etiology.

Objective: To enhance etiological characterization of ARIs within Tanzania's sentinel surveillance system using targeted next-generation sequencing (tNGS).

Methods: We analyzed 484 nasopharyngeal and/or oropharyngeal swab specimens collected from five geographic zones between October 2023 and September 2024. Total nucleic acids were extracted using Qiagen's Allprep Mini assay and sequenced using the Illumina Respiratory Pathogen ID/AMR Enrichment Panel (RPIP), enabling simultaneous detection of bacterial, viral, and fungal pathogens. Sequencing data were processed using the Illumina BaseSpace Explify® platform, which performed quality filtering, host read removal, and taxonomic classification. Statistical analyses were performed to assess pathogen distribution and co-detection patterns.

Results: A total of 57 species were identified, including 32 (56.1%) bacterial, 24 (42.1%) viral, and one (1.8%) fungal species. Across different taxa, the panel detected a total of 1088 microorganisms. Bacterial taxa predominated, and *Streptococcus mitis* (170/1088, 15.6%), *Actinomyces graevenitzi* (127/1088, 11.7%), and *Streptococcus pneumoniae* (122/1088, 11.2%) were most frequently detected. Among viruses, cytomegalovirus (54/1088, 5.0%), human adenovirus B (23/1088, 2.1%), and herpes simplex virus-1 (22/1088, 2.0%) were common. *Aspergillus niger* was the only fungal species isolated. High rates of co-detection were observed, with frequent bacterial co-occurrence of *S. mitis* and *Moraxella catarrhalis*, suggesting a predominance of upper respiratory tract colonizers rather than direct etiologic agents.

Conclusion: Targeted NGS expands pathogen detection beyond routine PCR-based surveillance, revealing diverse respiratory microorganisms, including both pathogens and commensals. Integrating tNGS into national ARI surveillance could improve pathogen detection, support antimicrobial resistance monitoring, and strengthen outbreak preparedness in Tanzania.

KEYWORDS: Acute Respiratory Infection; Respiratory Pathogen Identification and Antimicrobial Resistance Enrichment Panel; targeted Next-generation sequencing

OR-CHOL-02

Evaluation of the Integrated Disease Surveillance and Response (IDSR) System for Cholera disease, May 2023–September 2024

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Background: Cholera remains a persistent public health threat in Tanzania, largely driven by inadequate water, sanitation, and hygiene infrastructure. In 2023, through the use of IDSR system, the country was able to report 1,457 cases and 32 deaths. However, we are not certain whether the system was able effectively report the required cases. We used the outbreak season of May 2023 to September 2024, focusing on its effectiveness in

early detection and response across health system levels.

Methodology: A descriptive cross-sectional study was conducted using the CDC and Prevention updated guidelines for evaluating public health surveillance systems. Data on cholera cases were extracted from registers, while healthcare workers' knowledge of the IDSR system was assessed through interviews. Participants (n=30) were purposively selected, with five from each of the six facilities. Nine surveillance attributes were evaluated: simplicity, flexibility, data quality, acceptability, sensitivity, representativeness, timeliness, positive predictive value, and stability.

Results: The IDSR system achieved a mean performance score of 64.8%. Simplicity was high, with most participants reporting ease of use and reporting time under 10 minutes. Timeliness was 98.4% for weekly reports. Flexibility (93%) and acceptability (96.2%) were also high. Representativeness was moderate (70%) due to exclusion of children under two years in case definitions. Sensitivity was low (29.3%), with some discrepancies between e-IDSR, Mtuha and GoTHOMIS data. Data quality was poor due to missing and inconsistent records, while stability was affected by occasional system downtime. Positive predictive value was 0% due to lack of laboratory confirmation in the system.

Conclusion: The IDSR system demonstrated moderate performance but requires improvement. Key areas include training on case definitions to include children under two years, improving data quality, and integrating automated outbreak detection and case investigation tools into e-IDSR. Linking GoTHOMIS with e-IDSR could reduce duplication and strengthen cholera surveillance and response.

KEYWORDS: Epidemiology; Surveillance system Evaluation; Cholera; IDSR

OR-CHOL-03

Cholera Outbreak Linked to Food Exposure-Rukwa Region, Tanzania, February to May 2025

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Background: The Rukwa Region, Tanzania, experienced a significant cholera outbreak, reporting 1,323 patients and 15 associated deaths by May 21, 2025. To guide effective outbreak control efforts, this study aimed at identifying the key environmental, behavioral, and socio-demographic factors associated with cholera infection in the area.

Methods: We conducted an unmatched case-control study from February 7 to May 21, 2025. Cases were individuals from the line list meeting the national cholera surveillance case definition (suspected clinically or confirmed by laboratory testing), and controls were asymptomatic relatives or friends randomly selected from the same ward. Data was gathered using a structured questionnaire. We calculated crude odds ratios using logistic regression and included variables with $p < 0.2$ in a multivariable model. Statistical significance was set at $p < 0.05$ with 95% confidence intervals.

Results: We enrolled 232 participants: 85 patients with cholera and 147 controls. The median age was 19 years (interquartile range: 12-28), and 60% of cases were under age 20. Eating food prepared outside the home was the strongest predictor of infection (Adjusted Odds Ratio [AOR]: 6.42; 95% CI: 2.75-14.99; $p < 0.001$). Conversely, being older than 20 years was protective (AOR: 0.42; 95% CI: 0.22-0.79; $p = 0.007$). River or stream water use showed a borderline association with risk (AOR: 1.89; $p = 0.074$). While investigating, factors such as latrine type, handwashing after defecation, and availability of handwashing facilities were not statistically significant ($p > 0.05$).

Conclusion: Cholera infection was strongly associated with eating food prepared outside the home and with younger age. Public health measures include the temporary closure of food outlets, strengthening food hygiene in community food outlets through intensified inspections, strict adherence to safe food-handling practices, and focused hygiene education for younger residents. Following these actions, the outbreak was declared over two

months later.

KEYWORDS: Cholera; Case-Control Studies; Food Safety; Hygiene Practices; Tanzania

OR-CKD-01

Exploring barriers leading to late presentation of chronic kidney disease among patients at Amana hospital

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Background: Chronic Kidney Disease is a global health concern. Late presentation hinders effective management, often due to poor symptom awareness, financial barriers, and medication misuse, increasing morbidity and mortality.

Objective: To explore the patient-related barriers contributing to late-stage presentation of chronic kidney disease among patients at Amana hospital.

Methods: A qualitative research study was employed, in-depth interviews with 15 dialysis patients selected through purposive sampling. The interviews were audio recorded, transcribed, translated, and thematically analysed using Braun and Clarke's method.

Results: The study identified three major elements that contribute to the late onset of chronic kidney disease: personal barriers (little or no awareness of symptoms of kidney disease, dependence on traditional medication before turning to biomedical cures, sheer negligence and self-medication; mmisinterpretation of ssymptoms'); family and Social Influence: (well-intentioned but misinformed advice, lack of emotional support); health system related delays and barriers (excessive medical expenses, delayed diagnosis, llimited access to specialized care, delayed detection of onset of kidney problems).

Conclusion: Results show that Late presentation of chronic kidney disease (CKD) is driven by individual, social, and systemic factors. Limited awareness, reliance on traditional remedies, negligence, and misinterpreting symptoms delay care. Social influences, such as poor support and harmful advice, worsen the issue. Health system barriers like high costs, delayed diagnosis, and limited specialist access further compound it. Public education, community involvement, and health system improvements are key to promoting early detection and better outcomes.

KEYWORDS: chronic kidney disease; late-presentation; patient-related barriers; traditional medicine.

OR-DIG-10

Digital Transformation and Partial Implementation: How Hybrid Systems Enable and Constrain Ethics Review of Clinical Trials in Tanzania.

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Background: Research Ethics Committees (RECs) in Tanzania have adopted digital platforms for ethics review to enhance efficiency and transparency. However, in low- and middle-income countries (LMICs), partial adoption often introduces new challenges that remain understudied. This study examines stakeholder experiences across multiple RECs, combining quantitative turnaround time data with qualitative insights to explore how incomplete digital implementation yields efficiency gains while reproducing, or even worsening, longstanding bottlenecks in ethics governance.

Methods: A convergent mixed-methods design integrated qualitative semi-structured interviews (n=21) with purposively sampled stakeholders (analyzed via Braun and Clarke's thematic framework) and quantitative

analysis of review turnaround times from REC records (2021 to 2023), using descriptive and comparative statistics. Qualitative data collection occurred in June to July 2025.

Results: Qualitative analysis identified six interrelated themes: 1. Core functions of digital platforms 2. Efficiency gains and workflow improvements 3. Enhanced transparency and confidentiality 4. Technical and infrastructural barriers 5. Human and adaptive challenges 6. The paradox of partial digitalization, framed as a governance failure rather than a transitional phase, marked by persistent manual bottlenecks, especially offline issuance of ethical clearance certificates. Quantitative results showed median turnaround times of 46 to 63.5 days, with strong positive skewness and outliers up to 185 days. This validated qualitative reports: digital tools reduced validation and improved tracking, but unreliable internet, rigid system design, unequal training, and lack of end-to-end automation limited benefits, with manual certificate processing remaining a major delay source.

Conclusion: Partial digital transformation of ethics review can both enable and constrain governance outcomes. True efficiency and ethical improvements require full end-to-end automation, sustained capacity building, and user-centered design. Realizing digital systems' potential in Tanzania and similar LMIC settings demands investment in reliable infrastructure, continuous training across stakeholders, and reforms like digital signatures.

OR-DM-01

Assessing the prevalence clinical signs of Cardiovascular Autonomic Neuropathy in Diabetic patients with clinician knowledge

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Background: Cardiovascular Autonomic Neuropathy is a life-threatening microvascular complication causing up to 11% of deaths in diabetes mellitus patients due to heart conditions. Prevalence is high; 17% in diabetes type 1, 20% in types 2, and 40% among insulin-dependent patients. The International Diabetes Federation estimates a global diabetes prevalence of 8.8% in 2015, projected to rise to 10.4% by 2040. At Kinondoni, there is a critical lack of data and diagnostic readiness of clinicians.

Objectives: To determine the prevalence of CAN clinical features among diabetic clients and evaluate the level of diagnostic knowledge among clinicians.

Methodology: A cross-sectional study was conducted over one month at two health center and one hospital, involving 100 diabetes patients and 66 clinicians who were interviewed to evaluate their knowledge of cardiovascular autonomic neuropathy diagnostic protocols and screening practices.

Results: Among 100 clients assessed, 20% presented with all three clinical features, 10% had resting tachycardia and exercise intolerance without orthostatic hypotension, and 36% exhibited resting tachycardia as the only sign while 34% appeared normal. Among 66 clinicians, 70% had no cardiovascular autonomic neuropathy knowledge, 15% were knowledgeable but not practicing, while 9% performed assessments.

Conclusion: The clinical burden of cardiovascular autonomic neuropathy in Kinondoni with 66% of patient symptomatic contrasts with 85% of clinicians lacking functional diagnostic knowledge, posing a risk to patient safety. We recommend the Ministry of health should implement a mandatory refresher training program for clinicians at all diabetic clinics and integrate standardized cardiovascular autonomic neuropathy screening tool into routine care, health education to clients on obvious signs for early consultation. Keywords: Cardiovascular Autonomic Neuropathy, Diabetes Mellitus, Patients

KEYWORDS: CARDIOVASCULAR AUTONOMIC NEUROPATHY; DIABETES MELLITUS; PATIENT

OR-GBV-01

Gender Based Violence Among People Affected with Leprosy in Two Regions of Tanzania

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AFFILIATIONS

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Background: In Tanzania, the burden of gender-based violence (GBV) among people affected by leprosy has not been extensively researched. This study aimed to determine prevalence and associated factors of GBV among people affected by leprosy in two selected regions of Tanzania.

Methods: A cross sectional study was conducted in Tanga city, Muheza, Morogoro municipal and Mvomero district from 1st July 2024 to 3rd August 2024. Data was collected using a structured questionnaire which was administered to 255 people affected with leprosy. The questionnaire gathered information on GBV experiences, and whether the survivor of GBV sought and received help. Crude and adjusted prevalence ratios were used to measure association between GBV and socio-demographic factors.

Results: Mean age of study participants was 56.4 (SD=17.5). Overall prevalence of life time experience of GBV was 27.1%, of which 44.9% of experienced GBV one year prior to the survey. Economic violence was the most common type of GBV experienced in past year (83.9%). Perpetrators were non-family members (59.4%) who repeatedly committed GBV (65%). Half of the GBV incidences were not reported due to lack of financial power (91.4%). Predictors of GBV experience among people affected with leprosy were level of attaining secondary or high education, (APR 2.34; 95% CI 1.14 - 4.78; P=0.02), engaging in petty business (APR 1.62; 95% CI 1.01 - 2.59; P=0.046).

Conclusion: Economic and sexual violence are the most common form of GBV experienced by people affected with leprosy. The offence being repeatedly committed by non-family members. Lack of financial power limited survivors' access to GBV preventive and responsive services.

Keywords: Gender based Violence, Leprosy, Tanzania.

OR-GBV-02

Qualitative Insights into Gender-Based Violence and Health and Social Outcomes among People Affected by Leprosy

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Background: Gender-based violence (GBV) against persons affected by leprosy remains poorly documented, with most studies focusing only on women. Stigma, misconceptions about leprosy's contagiousness and rooted gender inequalities can worsen abuse and deteriorate health outcomes. This study explored the impacts of GBV on both men and women affected by leprosy in selected regions of Tanzania.

Methods: A qualitative exploratory study design was conducted in two leprosy-endemic regions in Tanzania, namely Tanga and Morogoro. Interviewed individuals were people affected with leprosy, District Tuberculosis and Leprosy Coordinators, Community Health Workers, and Community members. Data were collected through in-depth interviews and focus group discussions. The data was transcribed, translated, and then thematically analyzed.

Results: Gender Based Violence took the form of physical, sexual, psychological, and economic abuse. Consequences of GBV included marital breakdown, sexual denial, social exclusion, unemployment, and long-term physical and mental health problems such as depression and anxiety. Both genders experienced GBV, with women being excessively affected by sexual and domestic abuse.

Conclusion: Gender Based Violence significantly undermines the health, dignity, and socio-economic well-being of persons affected by leprosy. Integrated interventions among men and women combining stigma reduction, community education, psychosocial support, and legal protections are urgently needed to address the

intersection of GBV and leprosy.

KEYWORDS: Gender Based Violence; Leprosy; Tanzania

OR-HSS-01

Creating a Lifesaving Lens: Developing and Validating a Tool to Test Nurses' Knowledge of Identifying Early Warning Signs of Critical Illness in Adults.

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Background: Critical illness is a major challenge in developing countries, where resources and trained personnel are limited. Many patients deteriorate while in general wards, and nurses often lack the knowledge to identify and manage early warning signs of critical illness. Assessing and improving this knowledge can reduce the burden of critical illness, yet tools to evaluate nurses' knowledge in Tanzania are scarce. This study developed such a tool using standard scale development methods, like in-depth interviews, expert review, pilot-testing, validity, and reliability testing.

Methods: A multi-stage design was used. Questionnaire items were generated from literature and interviews with nine clinicians and healthcare providers, reviewed by seven experts, and pilot-tested with 20 participants at a national referral hospital in Tanzania. Face, content, and construct validity were assessed using data from 156 nurses. Cronbach's alpha evaluated reliability, while Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) assessed construct validity.

Results: A 26-item questionnaire was developed. Cronbach's alpha was 0.614, indicating moderate but acceptable internal consistency. Expert review yielded a Content Validity Index (CVI) of 1.0, reflecting strong agreement on item relevance. EFA and CFA extracted nine factors with loadings above 0.4, accounting for 58.8% of the total variance. Model fit indices were: Root Mean Square residual (RMR) = 0.012, Root Mean Square Error of Approximation (RMSEA) = 0.034, Goodness of Fit Index (GFI) = 0.886, Tucker-Lewis Index (TLI) = 0.864, and Comparative Fit Index (CFI) = 0.893, suggesting a moderate but acceptable fit.

Conclusion: The tool demonstrates moderate reliability and excellent content validity, providing a preliminary method to assess nurses' knowledge of early warning signs of critical illness in adults. Implications: This validated questionnaire can help institutions identify knowledge gaps and guide training. Future research should evaluate the translation of knowledge into clinical practice to improve timely interventions and patient outcomes.

OR-HSS-02

Strengths and Gaps of Clinical Trial Oversight Framework: A qualitative study in Tanzania and Ethiopia

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Background: Clinical trials (CTs) are increasing rapidly in sub-Saharan Africa, yet many countries lack clear, harmonized CT regulatory frameworks and adequate oversight capacity. The existing ones fail to meet the standards listed in the World Health Organization Global Benchmarking Tools (WHO GBTs), and are not harmonized because each nation has its own requirements. The capacity of regulatory and ethics committees in these countries is not matched with the increasing development of vaccines and other medical products. This

study aimed to identify strengths and gaps in the CTO framework in Tanzania and Ethiopia, and propose recommendations for improvement.

Methods: This was a cross-sectional study that involved interviews with National Regulatory Authorities (NRAs) and Research Ethics Committees (RECs) members, and other CT stakeholders, 42 in Tanzania and 40 in Ethiopia. Data were collected using structured interview guides, and analyzed with NVivo software (version 15).

Results: The CTO framework in Tanzania and Ethiopia demonstrated key strengths, including existence of CT policies and regulations, established monitoring and compliance mechanisms, independent national and institutional RECs, collaboration among regulatory institutions, and proper oversight of the research dissemination. Despite the observed strengths, these countries still face regulatory gaps, such as, inadequacy of guidelines addressing the new technologies, gaps in defining researchers' roles, shortage of staff within regulatory institutions, inadequate harmonization of regulatory processes leading to a prolonged approval process in some cases, absence of guidelines for herbal and traditional medicine research, financial constraints affecting oversight visits, lack of structured training programs, and non-compliance by researchers leading to delayed approvals.

Conclusion: While Tanzania and Ethiopia have strong CT regulatory frameworks, they fall short of the international standards outlined in the WHO GBTs. Addressing these gaps requires strengthened stakeholder training, enhanced community engagement, improved feedback and post-trial benefit frameworks, reinforced participant protection measures, and harmonized regulatory processes.

KEYWORDS: Clinical Trial Oversight; Framework; Gaps; and Strengths

OR-HSS-03

Assessment of cold chain management practice and its contribution on childhood vaccine wastage rates in Tanzania.

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Background: The essential elements of cold chain management system are include personnel trained for the vaccine supply chain, equipment, and standard operating procedures. Vaccine wastage is discarding unused vaccine doses in opened or unopened vaccine vials for closed-vial and open-vial vaccine wastage, respectively. Cold chain factors across all cold chain tiers were evaluated.

Methods: Across-sectional descriptive study was conducted to ascertain cold chain management practices and its contribution to childhood vaccine wastage rates. A multistage stratified sampling was used to account for geographic representativeness in Tanzania mainland in which seven geographical zones were selected. Healthcare workers(HW) participated. Data collection was through questionnaires , records, observation, and data extraction from temperature-monitoring devices from May to July 2025. Data were entered in KoboToolbox and analyzed in STATA software.

Results: Overall 87 facilities were included of which majority were health facilities (79.3%), government-owned (78%), and located in urban settings (59.77%). Majority of HW reported to receive training within 6 months of the study period (75%) and supervised within 12 months. Most 85(97.7%) facilities had fridge(s) and temperature monitoring devices; fridge tags in 65(76.47%) facilities, while Remote temperature Monitoring Devices (RTMDs) in 61(71.26%) facilities. Open vial vaccine wastage was evident in health facilities with 1-2 staff, trained for managing cold chain for OPV, PCV13, IPV, and Rota vaccine; p value <0.05. HPV vaccine wastage was associated with no training or training greater than 12 months (p value < 0.04).

Conclusion: The majority of health care and storage facilities were complying to the WHO cold chain management practices for vaccines. Low staffing involved in the vaccine cold chain and no training or training greater than 12 months were associated with open vial vaccine wastage for some antigens in this study. Strengthen human resource including on job training and cold chain active monitoring is the key.

KEYWORDS: Cold chain; vaccine wastage

OR-HSS-04

Developing a National Strategic Plan for Tuberculosis, Leprosy and Lung Health Amid Funding Constraints: Lessons from Tanzania

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Background: The development of National Strategic Plans (NSPs) for tuberculosis (TB) and leprosy is a critical process for guiding program priorities and resource allocation. In low- and middle-income settings, this process is increasingly challenged by shrinking external funding and constrained domestic resources. Tanzania developed its TB and Leprosy NSP (2026–2030) from July 2025 to January 2026 under significant funding constraints, requiring innovative approaches to ensure continuity, inclusiveness, and technical quality in a complex planning environment.

Methods: A participatory, multi-stakeholder approach was adopted, involving government institutions, technical and development partners, implementing partners, civil society, and community representatives. More than 150 stakeholders participated in the process. Due to financial limitations, a hybrid model combining targeted in-person consultations with frequent virtual engagements was implemented. Strategic coordination was led by the National Tuberculosis and Leprosy Programme (NTLP), with technical support from the World Health Organization (headquarters and country office), KNCV Tuberculosis Foundation, and the CDC Foundation. Structured thematic working groups and iterative review processes were used to ensure quality and consensus.

Results: Despite financial and logistical constraints, the NSP development process was successfully completed. Key challenges included limited funding for stakeholder participation, restricted subnational representation, limited availability of external thematic experts, delays in planned activities, and constrained resources for in-person consultations. These were mitigated through strengthened internal coordination, prioritization of critical activities, and flexible engagement approaches, including virtual platforms that expanded stakeholder participation. Catalytic partner funding supported key milestones. Strong technical guidance, combined with committed NTLP leadership and government support, ensured timely delivery and maintained high technical quality.

Conclusion: Tanzania's experience demonstrates that NSP development is feasible in resource-constrained settings through adaptive planning, strategic partnerships, and strong leadership. These lessons provide a practical and scalable model for countries facing similar financial constraints.

KEYWORDS: TB; Leprosy; National Strategic Plan; Financing Constraints; Multisectoral Collaboration; Tanzania

OR-HSS-05

"it is more than cash": Research personnels' perceptions of the appropriate forms of compensation for healthy volunteers in Tanzania

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Background: Clinical trials for preventive interventions are increasingly conducted in low- and middle-income countries (LMICs) such as Tanzania, yet there is no clear consensus on what constitutes appropriate compensation. A central ethical debate concerns how to balance fair reimbursement with the risk of undue inducement, particularly in resource-limited settings where financial offers may influence decisions to participate. Questions also remain about the role of non-financial benefits. We examined research personnel's perceptions of the appropriate forms of compensation in prevention trials in Tanzania.

Methods: Using a qualitative descriptive approach, we conducted purposive sampling to interview 36 research personnel from six prevention trials across two urban areas in Tanzania. Interviews were transcribed verbatim and analyzed thematically.

Results: Several important findings emerged from our study. Most participants considered monetary compensation appropriate for research participation; however, views differed on its structure, with some participants favoring a one-size-fits-all approach while others preferred flexible rates reflecting trial type, examination demands, and local living costs. Most participants emphasized safeguarding volunteers from trial-related harm through health insurance as an essential protection during or after the study. Some participants also valued social recognition—particularly certificates of appreciation—as a way of acknowledging and motivating volunteers' contributions. Finally, most participants supported involving volunteers in designing compensation structures to promote procedural fairness and transparency.

Conclusion: Structured engagement among researchers, ethics committees, and volunteers can guide the design of compensation models that go beyond financial payment. National frameworks, such as flat-rate compensation, could standardize practices while ensuring ethical consistency and fairness.

OR-HSS-06

From Process Integration to Resilience: The Mediating Role of Inter-Organizational Governance in Tanzania's Healthcare Supply Chains.

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Background: Persistent stockouts of essential health commodities continue to undermine healthcare delivery in Tanzania, affecting approximately 30-40% of public healthcare facilities despite substantial investments in supply chain reforms. These reforms, including initiatives such as the Electronic Logistics Management Information System (ELMIS), the Prime Vendor System (PVS), and Direct Health Facility Financing (DHFF), were introduced to improve coordination and efficiency in the Healthcare supply chain. However, these persistent disruptions suggest that existing interventions have not fully addressed underlying structural challenges. While process integration is widely recognised as a critical driver of supply chain resilience, its effectiveness remains inconsistent, particularly in fragmented healthcare systems characterized by weak coordination and misaligned incentives. Existing studies provide a limited explanation of how integration translates into resilience, especially the role of governance mechanisms in enabling coordinated and adaptive responses to disruptions.

Methods: This study examines the influence of process integration on healthcare supply chain resilience and the mediating role of inter-organizational governance. An explanatory sequential mixed-methods design was employed, combining a cross-sectional survey of public healthcare facilities in Dar es Salaam (n=365), analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM), with qualitative interviews involving key supply chain actors from the Medical Stores Department and Prime Vendor System.

Results: The findings reveal that although process integration dimensions significantly enhance integration capability, they do not directly affect healthcare supply chain resilience ($\beta = 0.120$, $p = 0.090$). Instead, governance mechanisms fully mediate this relationship, with contractual governance strongest, followed by relational and institutional governance. Qualitative evidence further shows that while integration improves visibility, effective response to disruptions depends on governance mechanisms that enable enforcement, alignment, and adaptive decision-making.

Conclusion: These findings demonstrate that resilience is a governance-enabled capability and highlight the need for policymakers to strengthen governance mechanisms alongside integration to enhance resilience in healthcare supply chains.

KEYWORDS: Healthcare Supply Chain Resilience; Process Integration; Inter-Organizational Governance; Tanzania.

OR-HSS-07

Patterns and Outcomes of Admissions in Intensive Care Unit at Tumbi Regional Referral Hospital (2021-2024).

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Background: Intensive care unit (ICU) mortality remains high in many low- and middle-income countries. Identifying admission patterns and mortality predictors is essential to improve outcomes and guide clinical practice.

Objective: To evaluate admission patterns, treatment outcomes, and determinants of mortality among ICU patients at Tumbi Regional Referral Hospital, Pwani, Tanzania.

Methodology: A retrospective cross-sectional study was conducted using records of patients admitted between 2021 and 2024. Variables included socio-demographic factors (age, sex), clinical characteristics (comorbidities, admission diagnosis), and treatment-related factors (mechanical ventilation, inotropes, ICU stay). The outcome was ICU mortality. Data were analyzed using SPSS. Descriptive statistics summarized patient characteristics. Bivariate analysis assessed associations with mortality, and variables with $p < 0.2$ were included in multivariate logistic regression. Statistical significance was set at $p < 0.05$.

Results: A total of 410 patients were analyzed. The median age was 50 years (IQR 25–75), and 73.7% had at least one comorbidity. The leading causes of admission were infectious (37.1%), neurological (31.7%), and respiratory (31.5%) conditions. Overall ICU mortality was 44.2%. Independent predictors of mortality included organophosphate poisoning, upper gastrointestinal bleeding, diabetic ketoacidosis, acute respiratory distress, and renal failure ($p < 0.05$).

Conclusion: ICU mortality was high, with several clinical conditions significantly associated with poor outcomes. Due to the retrospective design, causal inference is limited. Prospective studies with primary data collection are recommended to validate these findings and inform clinical decision-making.

Keywords:

ICU mortality; admission patterns; predictors; Tanzania; critical care

OR-HSS-08

Career Path Decisions and Influencing Factors Among Medical Students in Tanzania

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Background: Career path decisions among medical students are crucial for strengthening health systems, particularly in Tanzania, where physician shortages persist despite increasing medical graduate numbers. While many studies have focused on specialty preferences, few have examined whether students nearing graduation intend to remain in clinical medicine.

Objective: This study assesses the proportion of students intending to remain in the profession and identifies key influencing factors.

Methods: An analytical cross-sectional study was conducted among 292 medical students from Tanzanian medical universities between September and December 2024. Stratified random sampling was employed. Data were collected through an online structured questionnaire. Variables included demographics, initial motivations, and theory of planned behavior (TPB) constructs. Data analysis involved descriptive statistics, chi-square tests, and binary logistic regression.

Results: Of the participants, most were male (64.0%) and those aged 21-25 years old (77.7%). Precisely, 64.7% intended to remain in the medical profession, while 35.3% considered alternative careers. Intrinsic motivations such as a desire to help others (odds ratio [OR] = 2.90, $p < .001$) and personal interest (OR = 1.99, $p = .016$), along with perceived behavioral control (OR = 2.26, $p = .005$), were significant predictors. No significant associations were observed with demographic variables.

Conclusion: A significant portion of final-year medical students in Tanzania (over one-third) consider leaving the clinical field. This underscores the critical role of intrinsic motivation and perceived behavioral control in shaping career intentions. To enhance the retention of medical professionals, stakeholders should prioritize strategies that strengthen intrinsic drivers, reinforce self-efficacy, and improve supportive training environments.

Keywords: Tanzania; Career Path Decision; Medical Education; Medical Students.

OR-HSS-09

Ethical Perceptions as Contributors to Sexual and Reproductive Health Services Uptake Among Unmarried Adolescents: Quantitative Evidence from Morogoro, Tanzania

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Background: Despite national and global efforts to promote adolescent-friendly sexual and reproductive health services (SRHS) in Tanzania, utilization among sexually active adolescents aged 15–19 remains low (<20%). This gap may reflect a disconnect between adolescents' ethical expectations and prevailing community moral norms. Evidence on how factors such as informed consent, privacy, and confidentiality influence adolescents' use of SRHS is limited. This study examined associations between unmarried adolescents' concerns about informed consent, moral perceptions of premarital sex, privacy, and confidentiality, and their SRHS uptake in Morogoro, Tanzania.

Methods: The study surveyed 312 unmarried adolescents from Morogoro Municipality and Mvomero District using multistage sampling. Data were collected using a modified WHO-Cleland questionnaire, including 38 additional items assessing SRHS ethics (six-point Likert scale; Cronbach's $\alpha = 0.82$). Using STATA 18, exploratory factor analysis (EFA) identified underlying ethical domains (loading >0.5). Modified Poisson regression estimated associations between these domains and SRHS use.

Results: Only 18% of the 312 unmarried adolescents had ever used SRHS. EFA identified three perceived ethical domains: informed consent, moral perceptions of premarital sex and SRHS, and privacy and confidentiality; safety and fairness were excluded due to non-significant loadings. Modified Poisson regression showed that moral

perceptions (aRR = 1.34, 95% CI 1.04–1.74; $p = 0.025$) and privacy and confidentiality (aRR = 1.48, 95% CI 1.09–2.02; $p = 0.013$) were significantly associated with SRHS uptake.

Conclusion: This study highlights that adolescents often need perceived community moral approval to seek SRHS, yet their need for privacy and confidentiality remains critical. Navigating the tension between social expectations and access to confidential youth-friendly SRHS requires integrating ethical considerations into service design to improve utilization.

KEYWORDS: unmarried adolescents; adolescents' sexual and reproductive health; informed consent; privacy and confidentiality; moral perceptions; health service utilization; Tanzania

OR-HSS-10

Evaluating discordance between laboratory results and clinical presentation in Tanzanian healthcare settings

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Background: In low- and middle-income countries such as Tanzania, clinicians often encounter discordance between laboratory results and patients' clinical presentations, leading to diagnostic uncertainty and reduced trust in laboratory services. The objective of this narrative review is to examine the prevalence, causes, and mitigation strategies for such discordance.

Methods: This study is a narrative review based on the analysis of relevant scientific literature, policy, and regulatory documents. Relevant literature was sought using Google Scholar with the keywords: clinical presentation, laboratory results, discordance, medical practice, and Tanzania. The search was limited to publications not earlier than the year 2015. Gray literature was sourced using the Google search engine. Key information was systematically extracted, synthesized, and used to inform the manuscript. The findings were critically discussed to generate practical conclusions for improving clinical practice.

Results: Diagnostic accuracy based solely on clinical presentation varies widely depending on the condition, the patient population, and the clinical settings. Generally, clinical diagnosis is frequently discordant with final confirmed diagnoses, with overall accuracy often falling between 65% and 80%. Reasons for discordance usually fall under these three categories: (1) The inherent limitations of the tests due to specificity and sensitivity; (2) Pathogenesis of diseases where isolation of a particular pathogen may not necessarily imply a causal relationship with the presenting signs and symptoms; and (3) Human and technical errors. Moreover, three major sources of discordance between laboratory results and clinical presentation were identified, corresponding to the pre-analytical, analytical, and post-analytical phases of the diagnostic process. Discussion and

Conclusion: Discordance between laboratory findings and clinical presentation is seldom attributable to a single professional group; rather, it reflects systemic vulnerabilities within the diagnostic pathway and healthcare system. Strengthening collaboration among clinicians, nurses, and laboratory professionals is the most essential mitigation approach for improving diagnostic accuracy.

KEYWORDS: Discordance; Laboratory results; Clinical presentation; Tanzania

OR-HSS-11

Perceived effect of sliding aluminum window designs on indoor disease transmission and energy efficiency in urban Dar es Salaam, Tanzania: a mixed-methods study

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Background: Despite their widespread adoption in urban residential buildings, aluminum sliding windows may limit natural ventilation and lighting, with potential implications for indoor disease transmission and household energy use. It remains unclear whether homeowners, building professionals, and policymakers recognize these limitations or whether existing housing guidelines adequately address them.

Methods: This mixed-methods study was conducted in Dar es Salaam, Tanzania, between July and October 2025. Using a purposive sampling, a structured questionnaire was administered to 611 participants comprising 496 household respondents and 115 hardware store vendors, followed by focus group discussions with housing stakeholders including homeowners, architects, engineers, town planners, medical doctors, and representatives of national housing agencies.

Results: Out of 496 households, 47% (n=232) had installed aluminum sliding windows, and nearly all (96%) relied on electricity as their primary light source. Awareness of health risks associated with poor indoor ventilation was low, with only 44% of participants reporting awareness. No specific guidelines dedicated to window design currently exist. In multivariable logistic regression, large household size was the strongest predictor of both malaria (OR=2.65, 95% CI: 1.61–4.39, $p<0.001$) and respiratory infections (OR=3.74, 95% CI: 1.17–12.0, $p=0.026$). Gas cooking fuel was independently protective against respiratory infections (OR=0.35, 95% CI: 0.14–0.85, $p=0.021$). Sliding window design showed a borderline association with malaria (OR=1.65, 95% CI: 0.97–2.81, $p=0.064$). Aluminum sliding windows were significantly associated with reliance on fans as a proxy indicator of inadequate natural ventilation ($\chi^2(1)=5.72$, $p=0.017$). Only 7% of vendors had received training on window design. Window selection was driven by aesthetic preference, perceived security, popularity, residential location, and employment status.

Conclusion: Integrating public health principles into housing regulations, developing context-specific ventilation guidelines, and strengthening community awareness are necessary steps toward improving indoor environmental quality in rapidly urbanizing tropical cities.

KEYWORDS: Keywords: Housing; Ventilation, Health; Knowledge, Attitude, Practices; Urban Health

OR-HSS-12

Magnitude and Associated Factors of Dignity Preservation Among Hospitalized Patients. A Cross-Sectional Study of Bugando Medical Centre and Mwanza Regional Referral Hospital, North-Western Tanzania

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Introduction: Dignity is considered a fundamental human right and is recognized as one of the core concepts in patient care. Human beings have an intrinsic value that differentiates them from other creatures, and thus, they deserve respect and privacy, irrespective of their social status. Therefore, abuse of human dignity is also regarded as a violation of human rights.

Objective: This study aimed to determine the magnitude of dignity preservation and its associated factors among hospitalized patients.

Materials and Methods: This cross-sectional study was conducted among 270 hospitalized patients in the two teaching hospitals of Bugando Medical Centre (BMC) and Mwanza Regional Referral Hospital. Data were collected by trained research assistant using unstructured questionnaire of two sections: (a) Demographic characteristics

and (b) Patient dignity scale, including 32 statements. Data were analyzed by Stata version 15E software, whereby a student's t-test statistic was used to compare the total dignity mean score of demographic variables with two categories and the ANOVA test statistic for comparison of the total dignity mean score of demographic and other variables with more than two categories.

Results: There was a significant difference in the mean score of total dignity among males and females ($p=0.016$), single and married people ($p=0.005$), those who attended Bugando Medical Centre and Mwanza Regional Referral Hospital (Sekou Ture) ($p=0.002$), and those who were admitted to a private and general ward ($p=0.029$).

Conclusion: The healthcare system should consider dignity preservation through comprehensive education to healthcare providers about the importance of dignified care and patient rights in hospitals

OR-HSS-13

Mapping healthcare service utilisation for diabetes and hypertension in Tanzania mainland: Bayesian Spatial Modeling

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Background: Diabetes and hypertension contribute substantially to the growing burden of non-communicable diseases (NCDs) in sub-Saharan Africa. However, evidence on the spatial distribution and determinants of healthcare service utilisation remains limited, particularly at the district level. This study aimed to assess the spatial patterns and socio-demographic determinants of healthcare service utilisation for diabetes and hypertension in mainland Tanzania.

Methods: We conducted a cross-sectional analysis using district-level data from all 184 districts of mainland Tanzania for 2024. Choropleth mapping and Moran's I statistics were used to assess spatial patterns and clustering of healthcare service utilisation. Bayesian spatial models were fitted to identify geographic variation and associated socio-demographic factors, including literacy, mobile phone use, media ownership, and household size.

Results: Substantial geographic disparities in healthcare service utilisation were observed across districts. Utilisation for both diabetes and hypertension was consistently higher in urban districts and lower in rural areas. Significant spatial clustering was detected for hypertension, while diabetes showed weaker but statistically significant clustering. For hypertension, stronger clustering was observed among females. Higher district literacy was associated with increased utilisation for both diabetes (incidence rate ratio [IRR]=1.03; 95% credible interval [CrI]: 1.01–1.05) and hypertension (IRR=1.03; 95% CrI: 1.01–1.04). Increased mobile phone use was associated with higher utilisation for diabetes (IRR=1.10; 95% CrI: 1.06–1.14) and hypertension (IRR=1.06; 95% CrI: 1.02–1.10). Larger household size was associated with reduced hypertension service utilisation.

Conclusion: Tanzania mainland exhibits spatial inequalities in diabetes and hypertension healthcare service utilisation, with urban districts consistently showing higher healthcare service utilisation, while rural districts remain underserved. These findings underscore the need for spatially targeted NCD interventions and district-level resource allocation to ensure equitable access to chronic disease care.

OR-HSS-14

What Do Research Ethics Committees Really Focus On? A Quantitative Content Analysis Using Emanuel's Framework in Tanzanian Research Ethics Committees.

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Background: Research Ethics Committees (RECs) are essential for protecting participants, yet their practical priorities in resource-limited settings remain underexplored. This study assesses how Tanzanian RECs apply Emanuel's eight-principle ethical framework during protocol review.

Methods: A quantitative content analysis was conducted on 726 reviewer comments across 67 clinical trial protocols from three Tanzanian RECs (2021–2023). Comments were categorized using a modified Emanuel framework, and frequencies were calculated to identify patterns.

Results: RECs demonstrated a dominant focus on protocol structure (28.4%–43.7%) and scientific validity (7.5%–23.4%). Principles such as independent review (1.6%–3.0%) and social value (2.4%–6.0%) were consistently underemphasized. Variability was noted: REC 1 prioritized scientific rigor, REC 3 emphasized collaborative partnerships (13.4%), while all RECs neglected post-trial benefit considerations.

Conclusion: Tanzanian RECs exhibit selective conformity to Emanuel's framework, prioritizing procedural and scientific elements over equity-oriented principles. This risks approving methodologically sound studies that lack ethical depth, potentially perpetuating exploitative research dynamics. Recommendations include mandatory balanced-review templates, enhanced reviewer training, and institutional accountability mechanisms to promote comprehensive ethical oversight. **Keywords:** Research Ethics Committees, Emanuel's ethical framework, Clinical trial protocols, Ethical oversight, Tanzania.

OR-HSS-15

Opportunities and challenges for the integration of managing non-communicable diseases within HIV care and treatment services in Tanzania

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Background: People living with HIV and non-communicable diseases (NCDs) are reported to experience challenges in accessing affordable and high-quality NCD care services. Consequently, the World Health Organization (WHO) recommends care integration of NCDs within the HIV services in resource-limited regions. The available opportunities and challenges need to be understood and addressed for an effective integration process. This study explored opportunities and challenges for integrating NCDs within HIV care and treatment services in Tanzania.

Methods: An exploratory qualitative case study was conducted in Tanzania between April and July 2022. A total of 22 key informants working at the ministerial level, supervising the provision of healthcare services in Tanzania, were recruited purposefully for in-depth interviews. Thematic analysis was employed during the study assisted by

NVivo 12 qualitative data analysis computer software.

Results: Several opportunities were identified in the study for HIV/NCD services integration including the existence of an integration policy, the availability of regulations and guidelines, the existence of donor support, the presence of physical space and reliable information and communication systems, human resources adequacy, and political will to support the process. However, participants voiced concerns over the costs related to service integration, difficulties in reallocating donor funds, and hesitance of the healthcare providers as likely challenges to effective integration.

Conclusion: The findings of this study underscore that the effective and sustainable care integration of NCDs within HIV services relies on the availability of policy, funds, infrastructures, human resources, and stakeholders' willingness to support the process. With the favorable factors outweighing the challenges, our study underscores the importance of seizing this moment to collectively steer efforts toward integrated and comprehensive HIV care in Tanzania.

OR-HSS-16

Beyond the Checklist: Critical Gaps and Capacity Challenges in the Ethical Review of Clinical Trials in Tanzania.

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Background: Clinical trials are critical for medical innovation and health equity. In Tanzania, oversight relies on Research Ethics Committees (RECs), yet systemic gaps persist in ensuring rigorous ethical review.

Methods: A qualitative descriptive study using semi-structured interviews with 21 stakeholders (REC administrators, secretaries, reviewers, researchers) from four RECs in Dar es Salaam and Mwanza regions. Thematic analysis followed Braun & Clarke's six-step framework.

Results: Four neutral themes emerged: Volume of clinical trial submissions, Complexity of trial protocols, Availability of specialized expertise, Sufficiency of guidelines, and systemic processes. Sub-themes revealed inconsistent registration checks, infrequent submissions, protocol length, weekend/night reviewing, shortage of trial-experienced reviewers, and outdated checklists.

Conclusion: Tanzania's ethical review system operates in a paradox: digital infrastructure exists, but trial volume is minimal, and expertise is scarce. Updated guidelines, systematic capacity building, and automated oversight are needed. **Keywords:** Clinical trials, Ethical review, Research Ethics Committees, Qualitative study, Capacity challenges, Ethical oversight, Stakeholder perspectives.

OR-HSS-17

Post-trial Access during the COVID-19 Pandemic: An evaluation on the types and commitments from Research Ethics Committee members in six low-middle-income countries

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Background: Post-trial access (PTA) is an important ethical issue in clinical research, especially during emergencies like COVID-19, but its implementation and reporting are often unclear. The pandemic created challenges for fulfilling PTA commitments, while Research Ethics Committees (RECs) played a key role in reviewing related protocols. This study examined the types of PTAs and commitments reported by REC members in six LMICs during the COVID-19 pandemic.

Methods: A cross-sectional (content analysis) study was conducted using secondary data from RECs in six LMICs (Brazil, India, Nepal, Kenya, the Philippines, and Tanzania). Data included REC reports, meeting deliberation minutes, approvals, and documents on COVID-19 clinical trials submitted between 2020 and 2022. All trials were purposively included, totaling 438. The study examined whether PTA was pre-planned, the types proposed, and the REC discussions on PTA.

Results: PTA was reported in only a minority of trials, with no clear link to trial volume and PTA inclusion. Key themes in the qualitative analysis included poor transparency and documentation, confusion between PTA and related concepts, auxiliary care, focus on short-term benefits, limited REC engagement of PTA as an ethical requirement, and variation across countries. Overall, PTA was rarely clearly defined and often absent or implied in the trial documentation.

Conclusion: PTA remains inconsistently defined, underreported, and insufficiently integrated into clinical trial practices across settings. Greater standardization, improved documentation, and enhanced transparency in ethical review processes are needed to strengthen accountability and ensure equitable post-trial access.

KEYWORDS: Post-trial access; COVID-19; Clinical trials; Ethics; LMICs

OR-HSS-18

Informal Mobility and Disease Outbreaks: The Role of Motorcycle Taxi Riders (Bodaboda) during the Marburg Virus Disease Outbreak and Response in Tanzania

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Background: Infectious disease outbreaks unfold through both biomedical and social processes. In Africa, everyday mobility and access to healthcare depend heavily on informal transport systems such as motorcycle taxis (bodaboda). During outbreaks, these networks are often framed primarily as transmission risks, yet their social and practical roles in enabling access to care remain underexplored. This study explored how bodaboda riders shaped community response, care-seeking, and adherence to public health measures during the 2025 Marburg virus disease outbreak in Biharamulo District, north-western Tanzania.

Methods: A cross-sectional qualitative study was conducted in five wards in Biharamulo District. Data were collected through 24 in-depth interviews with health workers, community leaders, and traditional healers, focus group discussions with motorcycle taxi riders, community members, and non-participant observations of mobility practices. Results were analysed thematically using an inductive-deductive approach informed by social infrastructure and mobility frameworks.

Results: Findings show that bodaboda riders played a dual role during the outbreak. While their close contact with passengers ("sandwiching") and frequent movement raised concerns about disease spread, riders acted as vital intermediaries connecting households to health facilities. They often transported sick individuals, usually at night and from areas inaccessible to vehicles, functioning as informal emergency transport ("silent ambulances"). Riders also facilitated communication between communities and health authorities by relaying information, interpreting public health guidance, and managing stigma and fear. Economic insecurity influenced their compliance with mobility restrictions, highlighting the tension between outbreak control measures and livelihood

survival.

Conclusion: Informal transport networks form a vital part of social infrastructure during health emergencies. Incorporating bodaboda riders into preparedness and response plans through targeted engagement, risk communication, and infection prevention training could enhance referral systems and foster community trust. Recognising and collaborating with existing mobility systems has significant potential to boost outbreak response efficiency and influence health policy.

KEYWORDS: Outbreak response; Marburg virus disease; Bodaboda and healthcare; Tanzania

OR-HSS-19

Healthcare workers' perceptions of decentralised COVID-19 testing by GeneXpert platforms in Tanzania and Burkina Faso: Implications for Outbreak Management and Preparedness

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Background: Timely and accurate diagnosis of COVID-19 is essential for effective case management and containment of SARS-CoV-2. In many settings with fragmented laboratory systems, reliance on centralised reference laboratories limits the identification of suspected cases. Decentralising diagnostic services to district and regional facilities can improve case detection, management, and pandemic preparedness. While GeneXpert platforms have been widely repurposed for COVID-19 testing, evidence on frontline healthcare workers' perceptions of their decentralised use in sub-Saharan Africa remains limited. This study explored healthcare workers' perceptions in Tanzania and Burkina Faso to inform future epidemic preparedness strategies.

Methods: A qualitative exploratory descriptive study was conducted in Tanzania and Burkina Faso using in-depth interviews with purposively selected healthcare workers involved in SARS-CoV-2 testing between January 2023 and May 2024. Data were collected from clinicians, lab technologists, nurses, research officers and heads of health facilities using semi-structured interview guides and analysed through thematic analysis. Interviews were conducted in Kiswahili or French, audio-recorded, transcribed verbatim, and back-translated into English prior to analysis.

Results: A total of 35 participants were interviewed. Five key themes emerged: awareness of COVID-19 and SARS-CoV-2; familiarity with and advantages of the Xpert Xpress SARS-CoV-2 POC test; its added value at decentralised facilities; its influence on clinical decision-making (e.g. treatment, further testing, and patient satisfaction); and its role in epidemic response, including case detection, contact tracing, and isolation. Participants demonstrated strong knowledge of COVID-19 and emphasised the importance of decentralised testing in overcoming diagnostic challenges and improving outbreak control.

Conclusion: Healthcare workers perceive decentralised SARS-CoV-2 testing via GeneXpert as a valuable tool for improving diagnostic access and outbreak responsiveness and management in resource-limited settings. Further efforts are needed to optimise and scale up decentralised testing systems based on molecular based POC diagnostic strategies.

KEYWORDS: Decentralised testing; qualitative research; SARS-CoV-2; GeneXpert; Tanzania; Burkina Faso.

OR-HSS-20

Facilitators and barriers to Pandemic Prevention, Preparedness and Response in Tanzania: Stakeholder qualitative insights

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Background: The COVID-19 pandemic tested Tanzania's Pandemic Preparedness, Prevention and Response (PPPR) mechanisms, particularly in coordination and evidence-based action. Like other low-middle-income countries, vulnerable populations were disproportionately affected. The aim of this study is to explore stakeholders' perspectives on the factors that influenced Tanzania's COVID-19 response and to examine implications for future pandemic preparedness and response in the country.

Methods: Qualitative data was collected via 2 Key Informant Interviews with policymakers, 9 In-Depth Interviews with healthcare workers, and 4 Focus Group Discussions with 34 community members most affected by COVID-19. Key informant interviews focused on response measures and coordination systems, while affected communities shared their experience with COVID-19 and other pandemics. Thematic analysis was conducted using NVIVO 14 analysis software.

Results: Thematic analysis revealed three key themes that summaries facilitators and barriers to pandemic response in Tanzania: (1) Policy/structural (e.g. government denialism and response speed); (2) Health systems factors (e.g. healthcare workers capacity, medical resources); (3) Community factors (e.g. mistrust, stigma, cultural practices conflicting with response efforts, access masks/sanitizers). Participants highlighted pathways for equitable and community-centred PPPR. These included strengthening local health facilities; transparent risk communication; and establishing feedback mechanisms between health authorities and community leaders. Additionally, promoting participatory research that includes community perspectives for identifying context-specific challenges and developing appropriate solutions to build a more resilient health system.

Conclusion: A whole-of-society approach prioritizing collaboration fosters resilience for future pandemics and strengthening Tanzania's PPPR by: (1) enhancing local capacity via training/ resources/infrastructure; (2) building trust through communication; (3) establishing feedback mechanisms for transparency; and (4) participatory research addressing local challenges.

KEYWORDS: Pandemic Preparedness, Prevention, Response; Global Health

OR-HSS-21

Trends Toward Universal Health Coverage: Geographic Inequities in Comprehensive Primary Health Care Access across Zambia and Tanzania (2020-2025)

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Background: Access to timely healthcare encompasses availability, accessibility (geographic), acceptability, and affordability. Achieving Universal health coverage (UHC) requires progress across all four access dimensions, including geographic accessibility. Both Tanzania and Zambia have committed to UHC and structured their health

systems around a primary health care (PHC)-oriented delivery model, yet gaps in equitable access persist.

Methods: We assess progress toward UHC by examining geographic accessibility to PHC facilities and identify gaps in access to comprehensive PHC services in Tanzania and Zambia between 2020 and 2025. Geocoded national HF registries and gridded population datasets for 2020 and 2025 were compiled and harmonized to ensure temporal comparability. Facilities were classified as PHC or higher-level care, with a subset defined as model comprehensive PHC facilities based on WHO service availability criteria of essential services at first-contact facilities. Travel time to the nearest facility was estimated using least-cost path analysis under walking and motorized scenarios, with 30- and 60-minute thresholds used to assess changes in accessibility and coverage between 2020 and 2025.

Results: Number of facilities per 10,000 population increased modestly between 2020 and 2025 in Tanzania (All PHC: 1.50 to 1.70; Comprehensive PHC: 0.193 to 0.225) and Zambia (All PHC: 1.50 to 1.80; Comprehensive PHC: 0.879 to 0.875), gains were driven by expansion of general PHC services. Rural populations experienced longer travel and lower proximity to comprehensive PHC services. Accessibility improvements followed a clear spatial gradient: peri-urban and corridor areas showed substantial reductions in travel time, transitioning from moderate (30–60 minutes) to optimal access (0–30 minutes). In contrast, few remote or rural areas shifted from high (>60 minutes) to moderate travel times, indicating partial improvements that reduced but did not achieve optimal travel times.

Conclusion: Targeted investments in comprehensive service capacity and strategic placements in rural and remote areas are essential to reaching UHC.

KEYWORDS: Primary health care; Health accessibility; Travel time; Rural-urban disparities; Health facility mapping

OR-HSS-22

Lessons from the improved Community Health Fund experience for advancing universal health coverage in Tanzania

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Background: Achieving universal health coverage (UHC) in Tanzania requires evidence on how community-based health financing reaches vulnerable households, identifies priority health needs, and sustains continuity of coverage. This study generated lessons from the improved Community Health Fund (iCHF) experience to inform equitable and responsive UHC in Tanzania.

Methods: A descriptive analysis was conducted using iCHF cohort data from 13,211 individuals in 4,973 households across six regions of Tanzania, including 4,973 caregivers and 8,238 children. Demographic, household, geographic, clinical, and enrollment variables were analyzed.

Results: Most participants were rural residents (59.2%), and children comprised 62.4% of the cohort. Overall, 40.0% had documented chronic health conditions (CHC), with a markedly higher burden among children (61.9%) than caregivers (3.6%). Among 11,899 (90.1%) participants, enrollment was completed; the mean enrollment duration was 373 days. Although expected enrollment after payment was seven days, delays were linked to insufficient iCHF enrollers, limited transport for household visits, and delays in processing funds after deposit into regional accounts.

Conclusion: The iCHF experience shows that community-based financing can support UHC by identifying vulnerable households and sustaining follow-up, but operational bottlenecks may delay timely financial protection. Strengthening enrollment staffing, transport support, and fund-flow efficiency may improve iCHF performance, especially in rural settings.

KEYWORDS: improved Community Health Fund; universal health coverage; health financing; vulnerable households; Tanzania

Design, Implementation, and Impact of Health Insurance Schemes in Tanzania: A Narrative Review and Implications for the Universal Health Insurance System

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Background: Universal Health Coverage (UHC) remains a key policy priority in sub-Saharan Africa, including Tanzania, where high out-of-pocket (OOP) payments and limited insurance coverage constrain equitable access to care. Despite over two decades of health insurance reforms in Tanzania, coverage remains low (15.3% in 2023), with persistent fragmentation and inequities. The introduction of the Universal Health Insurance (UHI) marks a significant reform milestone, yet its success depends on lessons drawn from past schemes. This study synthesises evidence on the design, implementation, and effects of health insurance in Tanzania to inform UHI development.

Methods: A narrative review was conducted using the Arksey and O'Malley framework. Literature published between 2000 and January 2026 was identified from PubMed, Google Scholar, and grey sources. Studies were screened using predefined inclusion criteria, and data were extracted and synthesised thematically. Analysis was guided by the health financing framework, focusing on revenue collection, pooling, and purchasing functions, alongside UHC outcomes such as financial protection, utilisation, equity, and efficiency.

Results: Findings reveal that insurance schemes improved healthcare utilisation and reduced OOP spending, particularly for outpatient and maternal services. However, financial protection remains incomplete due to limited benefit packages, co-payments, and supply-side constraints. Fragmented pooling across schemes restricts cross-subsidisation and exacerbates inequities, especially between formal and informal sectors. Weak strategic purchasing, characterised by delayed reimbursements and misaligned provider incentives, limits gains in quality and efficiency. Implementation challenges include low enrolment in the informal sector, affordability challenge, administrative inefficiencies, and limited public trust.

Conclusion: Health insurance expansion alone is insufficient to achieve UHC. For UHI to succeed, Tanzania must prioritise pool integration or harmonisation, strengthen strategic purchasing, and expand subsidies for vulnerable groups. Complementary investments in service quality, governance, and digital systems are essential. Embedding UHI within a coherent, equity-oriented health financing strategy will be critical for UHC.

KEYWORDS: Universal Health Coverage; Universal Health Insurance; Health Financing; Health Insurance; Financial Protection

Pathways towards realization of Universal Health Coverage (UHC) in the implementation of Universal Health Act (UHA) in Tanzania

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Background: Health insurance coverage in Tanzania remains low, with only 16% of the population enrolled, due to affordability, service quality concerns, and weak implementation of exemptions and matching funds. The Universal Health Insurance Bill was enacted to expand coverage and strengthen financial protection toward UHC by 2030; however, clear policy pathways to achieve these goals remain limited.

Objectives: To identify policy pathways for advancing UHC in Tanzania by drawing lessons from better performing sub-Saharan African countries.

Methodology: A narrative review of literature, policy documents, and financing reports examined Rwanda, Ghana, Kenya, Ethiopia, Gabon, Zimbabwe, and South Africa—countries with notable insurance expansion over the past decade—using the three UHC dimensions: priority service coverage, population coverage, and reduction of

out-of-pocket spending.

Results: The analysis has revealed improved insurance coverage around 90% and 60% in Rwanda and Ghana respectively. In Tanzania, progress has been made in expanding priority health services and increasing population coverage; however, high out-of-pocket spending continues to limit financial protection, particularly among low-income households. Lessons from other countries highlight diverse policy approaches: mandatory community-based insurance with subsidies for poor households in Rwanda; government-supported community schemes in Ethiopia; earmarked taxation and social insurance financing for the national scheme in Ghana; inclusion of informal sector workers in Kenya; dedicated taxes on telecommunications and financial transactions to support insurance coverage in Gabon; a health levy on mobile airtime and data in Zimbabwe; and pooled public financing with strengthened governance under national insurance reform in South Africa.

Conclusion: Lessons from these countries suggest that Tanzania could accelerate progress toward Universal Health Coverage by combining community-based enrolment, targeted subsidies for vulnerable groups, earmarked taxation, inclusion of informal sector workers, and stronger pooled financing. Achieving this will require stronger domestic resource mobilization and improved governance and accountability within the national health insurance system.

KEYWORDS: Realization of UHC; Pathways; Strategies from other SSA Countries; Tanzania

OR-HSS-25

Experiences and perceptions of providers and purchasers Concerning provider payment methods in Tanzania

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Background: Strategic purchasing is central to achieving Universal Health Coverage (UHC) and requires careful design of provider payment methods (PPMs) to influence provider behaviour, efficiency, equity, and quality. Tanzania is introducing Universal Health Insurance (UHI), but PPM design remains under development.

Methods: This study explored providers' and purchasers' experiences with existing PPMs to inform UHI payment reforms. The cross-sectional, sequential mixed-methods study in two Tanzanian regions (Manyara and Singida). Qualitative data were collected through 21 in-depth interviews, 14 group interviews across 22 primary facilities, and 10 key informant interviews with purchasers (government, insurance agencies, and development partners). Quantitative data came from a survey of 245 providers in 84 facilities. Providers reported managing multiple PPMs with different reporting requirements, payment schedules, and accountability mechanisms, creating an administrative burden and financial management challenges.

Results: Across all PPMs, operational challenges included perceived inadequate payment rates, reimbursement delays, and limited predictability. National Health Insurance Fund's (NHIF) fee-for-service was viewed as more predictable due to predefined rates, while capitation for Health Sector Basket Fund (HSBF) and improved Community Health Fund (iCHF) were less predictable due to unclear adjusters, irregular payments, and enrolment challenges. Reporting requirements were perceived as more complex for NHIF and iCHF compared to HSBF. Co-payment were less accepted among NHIF providers than among those under HSBF and iCHF capitation. Payment delays were common across PPMs, but highly reported for iCHF capitation, averaging up to 5.5 months. Performance requirements were generally valued as promoting accountability, though some providers noted

concerns about fairness and contextual feasibility.

Conclusion: While PPMs remain central to strategic purchasing reforms in Tanzania, fragmentation and implementation weaknesses may undermine their effectiveness. Strengthening coordination across schemes, improving payment predictability and timeliness, simplifying administrative processes, and building provider capacity will be critical for advancing UHC.

KEYWORDS: Capitation; Fee for service; Primary healthcare; Provider payment methods.

OR-HSS-26

Strengthening Health Systems for Universal Health Coverage in Tanzania: Integrating Workforce, Financing, and Digital Innovations.

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1. *kiut*

Background: Tanzania’s commitment to Universal Health Coverage (UHC) under Development Vision 2050 requires resilient systems capable of delivering equitable, quality care without financial hardship. Despite ongoing reforms, persistent challenges particularly workforce attrition, constrained domestic financing, and fragmented digital platforms continue to slow progress toward UHC.

Objectives: This study aims to: Assess the sustainability of health workforce expansion and retention efforts; Examine domestic resource mobilization strategies and their implications for financial protection; Evaluate the contribution of digital health innovations to service delivery and system integration; Propose integrated policy actions to accelerate UHC attainment.

Methods: A mixed-methods policy analysis was conducted using data from the Tanzania Demographic and Health Survey (2022), Afrobarometer Dispatch No. 992 (2025), Ministry of Health budget reports, peer-reviewed workforce studies, and evaluations of Kadi ya Matibabu (Zanzibar) and GoTHOMIS. Thematic analysis was applied to qualitative interviews with 76 health sector stakeholders.

Results: Between 2020/21 and 2024/25, 34,720 health professionals were recruited, with over 70% deployed to rural areas. The first phase of the national community health worker program trained 3,561 CHWs toward a five-year target of 137,294. However, projections indicate that up to half of young physicians may leave the public sector due to low remuneration and limited career advancement. To offset declining donor funding for HIV, TB, and malaria programs, the government allocated US\$114 million (Sh298 billion) in 2024/25–2025/26 and introduced new tax-based revenue measures. Insurance coverage remains low at 16%, and cost barriers persist. Digital reforms show promise, with 93% population registration in Zanzibar’s Kadi ya Matibabu system, though infrastructure gaps constrain scale-up.

Conclusion: Integrated reforms strengthening workforce retention, domestic financing, and digital systems are critical to achieving UHC in Tanzania. Sustained political commitment and coordinated investment will determine long-term success.

OR-HSS-27

Assessing the implementation gap of disability inclusive health in Tanzania’s universal health insurance act

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Background: Tanzania’s Universal Health Insurance (UHI) Act of 2023, which came into effect on August 16, 2024, represents a significant step toward achieving Universal Health Coverage (UHC) by mandating health

insurance for all citizens, including subsidized premiums for “poor and vulnerable populations” such as persons with disabilities (PWDs). While the Act signals a strong commitment to health equity and disability rights in line with national and global frameworks, financial coverage alone is insufficient to guarantee equitable access for PWDs.

Methods: By synthesizing data from the existing literatures, this article highlights the persistent disc

Methods: connect between legislative intent and the lived realities of PWDs in accessing health services. It argues that true inclusion requires a multidimensional implementation strategy that confronts structural, social, and systemic barriers.

Results: Key challenges include the need for a disability-inclusive benefit package that encompasses assistive technologies and rehabilitation; removal of accessibility barriers beyond infrastructure such as communication, information, and stigma; improved availability of disability-disaggregated data for policy accountability; strengthening of health worker competencies in disability-inclusive care; and active, sustained engagement of Disabled People’s Organizations (DPOs) in policymaking and implementation. Without addressing these gaps, the Act risks falling short of its transformative potential. To ensure no one is left behind.

Conclusion: Tanzania must invest in deliberate, inclusive, and well-resourced implementation measures that center the rights and experiences of persons with disabilities in its UHC journey.

OR-HSS-28

Association between health insurance status and healthcare services utilization of rural population in Hai District-Northern Tanzania: Community-based study in 2025

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Introduction: Nearly half of the population globally is reported to be unable to access basic health services, one of the key reasons is the burden of healthcare costs. Less than 50% of the entire population in Africa is able to access basic quality health services where the worst globally in Sub-Saharan Africa with less than 42.56%. Health insurance has been stated by WHO to alleviate financial hardship and improve utilization of healthcare services. This study aims to determine the association between health insurance and healthcare utilization

Methods: A cross-sectional study was conducted using multistage sampling among 494 households. The dependent variable was healthcare utilization, and the key independent variable was insurance status. Descriptive statistics summarized participant characteristics. Multivariable regression used to assess the magnitude of association. A p-value of <0.05 was considered statistically significant.

Results: Of 494 participants (mean age 41.4 ± 15.4 years), 26.9% reported healthcare service utilization in the past 12 months, with outpatient (30.6%) more common than inpatient (12.6%). 18.2% of participants had insurance, utilization was significantly higher among insured (43.3%) than uninsured (23.3%; $p < 0.001$). Health insurance coverage (AOR = 2.24; 95% CI: 1.22–4.11; $p = 0.010$), marital status (married: AOR = 2.74; 95% CI: 1.41–5.30; $p = 0.003$), higher income (>TZS 500,000: AOR = 4.27; 95% CI: 2.03–8.99; $p < 0.001$), recent illness (AOR = 2.91; 95% CI: 1.80–4.73; $p < 0.001$), and chronic medication use (AOR = 3.38; 95% CI: 1.77–6.48; $p < 0.001$) were significantly associated with healthcare services utilization.

Conclusion: Health insurance was significantly associated with increased healthcare service utilization among the rural population. Marital status, higher household income, recent illness, and chronic medication independently influenced healthcare utilization. It is crucial expanding insurance coverage and address economic barriers to enhance equitable healthcare access and improve utilization in rural populations.

The Legal Framework Governing Operations of the National Health Insurance Fund (NHIF) in Tanzania: A Tool for Combating Fraud?

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Background: The National Health Insurance Fund (NHIF) in Tanzania provides health insurance to citizens to ensure that there is universal health coverage in the country. Despite the fact that NHIF is established and guided by its Act of 1999 the fund has continuously faced with services providers fraud for many years. so, this paper is set to analyze legal framework guiding the operations of NHIF to establish if it is the tool for combatting services providers fraud in HHIF.

Methodology: This paper uses secondary data such as the NHIF's annual performance reports, the legal and policy documents guiding NHIF operations, audit and evaluation reports, statistics and case records, and studies on fraud in national health insurance carried out by other scholars within and outside Tanzania to establish if the legal framework guiding the operations of NIHF is the tool to combat services providers fraud. Moreover, primary data generated from purposively selected Key Informant (KIs) from the office of the Director General and the Anti-fraud Unit was used.

Results: The analysis revealed that there has not been a clear, statutory definition of fraud for many years. It has also revealed a lack of a legal mandate to do biometric verification of members and of integrated ICT systems, existence of a weak statutory backing for contractual control, a limited multidisciplinary investigative capacity, and inadequate penalties provided for under the NHIF Act of 1999.

Conclusion: Although there have been positive policy developments recently, this article recommends formulating a clear and legally binding definition of fraud, mandatory technological safeguards, strong statutory support for administrative enforcement of legal framework, a coordinated and specialized investigation of services providers fraud and robust, proportionate penalties to prevent fraud.

KEYWORDS: National Health Insurance; Fraud; Legal Framework; Biometric verification

Mobile Phone-Based Health Insurance as a Pathway to Mandatory Health Coverage in Tanzania: Opportunities and Barriers among Urban Informal Sector Operators

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Background: Achieving mandatory health coverage remains a major policy challenge in Tanzania, particularly among urban informal sector operators who constitute the majority of the workforce yet remain largely uninsured. Despite rapid expansion of mobile phone penetration and supportive policy frameworks such as the Digital Health Strategy (2019–2024), health insurance uptake has remained low. Mobile phone-based health insurance has been promoted as a potential pathway to expand coverage; however, its effectiveness is shaped by institutional arrangements and policy environments that influence participation.

Objectives: This study examines the extent to which mobile phone-based health insurance can serve as a pathway toward mandatory health coverage in Tanzania by exploring opportunities and barriers among urban informal sector operators.

Methodology: A qualitative exploratory design was employed in Dar es Salaam and Dodoma. FGDs and key informant interviews involving informal workers, healthcare providers, and regulatory officials were done. Participants were purposively selected. Data were transcribed and analysed thematically, guided by the Social

Behavioural Model (SBM) and Ecological Systems Theory (EST).

Results: Mobile phone-based platforms improve convenience by enabling remote premium payments, reducing transaction costs, and expanding access. However, these benefits are constrained by significant barriers, including low digital literacy, language exclusion, mistrust in digital systems, weak public sensitisation, and fragmented institutional coordination. Policy and institutional factors, such as voluntary enrollment frameworks, reimbursement-based service delivery, and weak enforcement mechanisms, undermine trust and limit sustained participation. Many participants perceived mobile insurance as digitising existing inefficiencies rather than improving healthcare access.

Conclusion: Mobile phone-based health insurance has the potential to enhance coverage but remains insufficient as a standalone pathway toward mandatory health coverage. Strengthening institutional coordination, improving policy enforcement, enhancing public education, and transitioning toward a compulsory and cashless system are critical to ensure that digital innovations contribute to inclusive and effective health financing in Tanzania.

OR-NUTR-08

A pilot study on the use of the fortification monitoring and surveillance (fortimas) methodology for universal salt iodation in Tanzania

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Background: Tanzania lacks a structured Universal Salt Iodization (USI) surveillance system, hence relies on nationally representative surveys that are expensive, take a long time and do not provide sub-national estimates for timely programmatic response. We piloted the Fortification Monitoring and Surveillance (FORTIMAS) methodology to assess and track the coverage and impact of iodized salt at subnational levels, and evaluated its feasibility, validity and reliability.

Methods: A cross-sectional survey was conducted in five purposively selected salt-producing regions and repeated in 3 regions after 2 months. Both urban and rural districts were represented, with two sentinel health facilities and two sentinel primary schools randomly selected in each district. A total of 925 first-trimester women (repeat=334) and 920 pupils (repeat=366) participated in the study. Select socio-demographic characteristics and obstetric information were collected. Urine remnants were collected from the sentinel health facilities, and salt from the sentinel primary schools. Iodine in salt and urine samples was analyzed using titration and the Sandell-Kolthoff reaction, respectively.

Results: About 39% of the salt samples were adequately iodized, while 22% had no iodine. The overall median Urinary Iodine Concentration (mUIC) among pregnant women was 290 µg/L (with 300 and 268 µg/L in phase I and II, respectively), exceeding WHO thresholds. About a third of the women were at risk of deficiency (30.2%), and some had excessive intake (25.8%). FORTIMAS showed moderate to high validity (p-value = 0.028) and reliability (ICC: 0.54–0.79). More than 90% of sentinel staff reported accepting the FORTIMAS.

Conclusion: FORTIMAS is a feasible, valid, and reliable surveillance method providing real-time, sub-national specific data to inform timely programmatic decisions

KEYWORDS: FORTIMAS; Salt Iodine concentration; Median Urinary Iodine Concentration; Tanzania

OR-NUTR-09

Co-designing Contextualized Innovative Solutions for Improving Group Salt Consolidation Model: Findings from a Human-Centered Design in Tanzania

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Background: Approximately 43% of salt in the Tanzanian market is not iodized due to limited participation of small- and medium-scale salt producers (S/MSSPs). In 2021, the government introduced a group salt consolidation model with modern iodization technology and training, but its effectiveness remains unevaluated. This study assessed implementation, identified challenges, and co-designed a context-specific model using a human-centered design (HCD) approach (Abookire, 2020).

Methods: A cross-sectional study employed a five-step HCD approach, starting with community-driven discovery involving focus groups and key informant interviews with S/MSSPs and Council Health Management Teams (CHMTs) in three purposively selected salt-producing districts to identify challenges. Consultative ideation and co-creation meetings followed with representatives of S/MSSPs and CHMTs from the same Districts to develop a rough prototype. Acceptability, feasibility, and sustainability of the rough prototypes were validated through focus groups in two additional districts. Refinement meetings with S/MSSPs, CHMTs, and national-level salt stakeholders led to the final prototype. The process concluded with documentation and sharing of lessons learned.

Results: Knowledge gaps, production issues, leadership problems, and budget constraints were key challenges discovered affecting the implementation of group salt consolidation. Ideation and co-creation meetings resulted in 34 solutions grouped into ten interventions; four were rated most acceptable and feasible in the local context, and formed rough prototype. Validation findings highlight the need for inclusive communication, comprehensive implementation of interventions, and strengthened salt production as a core strategy. Refinement meeting resulted in final prototype model comprising three key interventions with the highest score: designing education programs (129/150), strengthening salt producer groups (121.6/150), and improving the salt market (121.1/150).

Conclusion: The study showed that HCD approach effectively engaged S/MSSPs and USI implementers in developing a tailored solution for the production of iodized salt. Future efforts should focus on field testing the prototype group model for scaling up.

KEYWORDS: Group consolidation model; Human-Centered Design; salt producers; Iodized salt; Tanzania.

OR-TB-01

Understanding gaps in care-seeking and Tuberculosis service availability in Tanzania: insights from patient pathway analysis

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Background: Patient Pathway Analysis (PPA) assesses alignment between patient care-seeking behaviour and availability of tuberculosis (TB) diagnostic and treatment services. In May 2025, Tanzania conducted a national PPA to quantify gaps in access to TB diagnosis and treatment across levels and sectors of the health system, to

inform strategic planning and improve equitable service delivery.

Methods: A cross-sectional descriptive PPA utilizing multiple national datasets, including the Health Facility Registry (2024), Demographic and Health Survey (2022), NTLP diagnostic site master list, and DHIS2-ETL data. A total of 13,174 health facilities were categorized by level (L0-L3) and sector (public, private, informal). Care-seeking patterns were estimated using DHS proxy indicators (fever). Availability of TB diagnostic and treatment services was mapped, and key indicators included diagnostic and treatment coverage and access at the initial point of care.

Results: Overall, 58% of patients initiated care at public Level 1 facilities, while 24% first sought care at private Level 0 outlets, including pharmacies and Accredited Drug Dispensing Outlets (ADDOs). However, diagnostic capacity at these entry points was limited, with only 15% of public Level 1 and 8% of private Level 1 facilities offering TB diagnostic services. Consequently, only 15% of patients accessed TB diagnosis at their first visit. Treatment availability was higher but remained suboptimal, with 41% of patients accessing treatment services at initial contact. Public facilities provided the majority of treatment services, while private and informal sectors had limited capacity and utilization.

Conclusion: There is a substantial mismatch between patient care-seeking patterns and TB service availability in Tanzania. Strengthening diagnostic and treatment capacity at lower-level facilities, strengthening referral systems, and engaging private and informal providers are critical to improve early detection, timely treatment, and overall TB outcomes.

KEYWORDS: Tuberculosis; Patient Pathway Analysis; Health Systems; Access to Care; Tanzania

OR-TCIM-03

Absorbing Shockwaves of Policy Endorsing Official Integration of Traditional and Complementary Herbal Medicines in the National Healthcare System of Tanzania

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Background: Following the Government of Tanzania's policy decision endorsing the co-practice of traditional and complementary medicines (T&CM) of herbal nature, studies undertaken to seek evidence on the challenges encountered in relation to the translation of the recommended integration into real-world practice are still quite few. Therefore, there is no assurance of whether the benefits of the respective policy recommendation outweigh the costs or the opposite is true. Therefore, the hypothesis that there are more benefits than costs remain subject to be tested via a formal research.

Objective: To argue in favour of the potentially testable hypothesis that: "The Tanzania Government's decision to establish a policy endorsing a co-practice of T&CM or herbal nature in the national healthcare system has not brought more benefits than the costs due to an imbalance between the organizational, practical, and health outcomes related facilitators on one hand and the barriers or limitations on the other".

Methodology: Giving a talk rationalizing the stated hypothesis based on the review of the available research and anecdotal evidences, as well as presenters' areas of expertise and lived experiences.

Results: The Government's policy decision in question is generally acknowledged by stakeholders. However, there are skeptics that organizational (including structural and process governance) systems, controversial or conflicting drug dispensing and prescription behaviours, mismatch between the patients' expressed preferences for particular drugs and those of the professional drug prescribers, as well as supply reliability and affordability of either type of medicines challenges, could be influencers of patients' health seeking behaviors and the service providers' drug prescription ones.

Conclusion: Research is needed to either accept or to reject the above-stated hypothesis as evidence is needed as part of preparation for absorbing shockwaves if arising from the authorized Integration

KEYWORDS: traditional medicines; complementary medicines; conventional medicines; integration; health systems; Tanzania

OR-TCIM-05

Integrating Traditional and Alternative Medicine in Antenatal Care Guidelines

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Background: Herbal medicine use during pregnancy is common in Tanzania, with prevalence estimates of up to 80%. Although often perceived as safe, some herbal products contain bioactive compounds that may contribute to adverse maternal and neonatal outcomes. Despite efforts to regulate Traditional and Alternative Medicine (TAM), antenatal care (ANC) guidelines are limited.

Objective: To identify medicinal plants used during pregnancy, assess available evidence on their efficacy and safety, and develop evidence-informed recommendations for integrating TAM considerations into ANC guidelines in Tanzania.

Methods: A scoping review was conducted following PRISMA-ScR guidelines. PubMed, Web of Science, Scopus, African Index Medicus, Maternity and Infant Care, and CINAHL were searched from inception to July 2025. Data on study characteristics, medicinal plants, efficacy, and safety were extracted and summarized using descriptive statistics in Microsoft Excel. To inform recommendations, Tanzania's ANC guidelines, TAM policy documents, and published reviews on risks associated with herbal medicine use during pregnancy were reviewed to identify policy gaps.

Results: A total of 330 plant species from 82 families were identified across 14 regions. Morogoro, Pwani, and Kagera exhibited the highest species diversity. The most represented families were Fabaceae (57 species), Rubiaceae (22 species), and Asteraceae (18 species). Frequently cited plants included *Azadirachta indica* A. Juss. (neem) had five citations, *Annona senegalensis* Pers. had four citations, and *Ricinus communis* L. (Castor oil) had four citations. Twelve maternal conditions were reportedly managed using these plants. However, only 23 species (7%) had published evidence supporting their therapeutic use, and 74 species (22%) had published safety data.

Conclusion: Medicinal plant use during pregnancy is widespread in Tanzania, yet evidence supporting the efficacy and safety of most species remains limited. Integrating evidence-informed TAM considerations into ANC guidelines may strengthen counseling and management of herbal medicine use during pregnancy and support safer maternal and neonatal health outcomes.

KEYWORDS: Herbal medicine; pregnancy; Tanzania; maternal and infant outcomes; antenatal care; health policy

OR-TCIM-11

Phytochemical profiling and characterization of bioactive compounds in medicinal plants used by traditional practitioners

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Background: Medicinal plants have constituted the foundation of traditional healthcare systems for centuries, with their therapeutic efficacy rooted in empirically acquired indigenous knowledge. Despite their widespread use

by traditional practitioners, many of these plants lack comprehensive scientific validation regarding their specific chemical constituents. This study focuses on the phytochemical profiling and characterization of bioactive compounds in selected medicinal plants commonly employed by traditional healers. The primary objective was to identify and analyze the secondary metabolites responsible for the pharmacological properties attributed to these plants, thereby providing a scientific basis for their ethnomedicinal applications.

Methods: Plant materials were collected based on ethnobotanical surveys and interviews conducted with local traditional practitioners, who provided detailed information on their usage patterns and therapeutic indications. The samples were processed, and sequential extraction was performed using solvents of increasing polarity to obtain crude extracts. Preliminary phytochemical screening was conducted using standard qualitative methods to detect the presence of major classes of bioactive compounds. Subsequent characterization and identification of specific constituents were achieved through advanced analytical techniques, including Gas Chromatography-Mass Spectrometry (GC-MS) and Fourier Transform Infrared Spectroscopy (FTIR).

Results: The phytochemical profiling revealed the presence of diverse secondary metabolites, including alkaloids, flavonoids, tannins, saponins, glycosides, and terpenoids. GC-MS analysis further identified specific bioactive compounds with known pharmacological activities, such as phenolic compounds with antioxidant potential, antimicrobial agents, and anti-inflammatory constituents. These findings provide a chemical rationale for the traditional therapeutic applications documented among the studied communities.

Conclusion: The characterization of these bioactive compounds validates the ethnobotanical knowledge of traditional practitioners and contributes to the growing body of scientific evidence supporting plant-based medicine. Furthermore, this research underscores the importance of documenting and preserving indigenous medical systems while exploring their potential for modern drug discovery and development.

OR-TCIM-12

Chemometrics analysis of standardized herbal extracts for quality control in traditional medicine intergration

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Background: The integration of traditional medicine into mainstream healthcare systems requires robust scientific frameworks to ensure the safety, efficacy, and consistency of herbal remedies. However, the inherent chemical complexity and variability of plant-based preparations pose significant challenges for conventional quality control methods. This study employs chemometrics analysis of standardized herbal extracts as a comprehensive approach for quality control in the context of traditional medicine integration. Chemometrics, which applies statistical and mathematical methods to chemical data, offers powerful tools for processing complex analytical datasets to establish reliable quality parameters.

Methods: Standardized herbal extracts were prepared from selected medicinal plants commonly used in traditional practice, following Good Agricultural and Collection Practices and consistent extraction protocols. The extracts were subjected to comprehensive analytical fingerprinting using chromatographic techniques, including High-Performance Liquid Chromatography, and spectroscopic methods such as Fourier Transform Infrared Spectroscopy and Ultraviolet-Visible spectroscopy. The multivariate datasets generated were processed using chemometric tools, including Principal Component Analysis, Hierarchical Cluster Analysis, and Partial Least Squares Discriminant Analysis, to identify patterns, classify samples, and establish discriminant markers.

Results: The chemometric analysis successfully differentiated authentic samples from adulterated or substituted materials, identified chemical markers characteristic of specific plant species, and quantified variations attributable to geographical origin, harvesting seasons, and processing methods. Distinct clustering patterns were observed, correlating with phytochemical profiles and enabling the development of reliable classification models

for quality assessment. The identified chemical markers served as reliable indicators for standardization and quality control purposes.

Conclusion: These findings demonstrate that chemometrics-assisted fingerprinting provides a robust, scientifically valid approach for the quality control of standardized herbal extracts. This methodology supports the integration of traditional medicine by establishing reproducible quality standards, ensuring batch-to-batch consistency, and building confidence among healthcare practitioners and regulatory bodies. The approach facilitates the development of pharmacopoeial standards for traditional medicines

OR-WASH-01

Water Sanitation and Hygiene Financing in Tanzania Primary Healthcare Facilities: Trends, Gaps, and Policy Implications

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Background: Water, Sanitation, and Hygiene (WASH) are critical for infection prevention and control (IPC) in healthcare facilities (HCFs). Weak WASH and IPC systems drive healthcare-acquired infections and antimicrobial resistance, undermining patient safety. Inadequate financing remains a major barrier in low- and middle-income countries. This study examined the effects of sectoral reforms on budgeting and expenditure for WASH in Tanzanian HCFs.

Methods: We conducted a descriptive trend analysis using secondary budget and expenditure data from 334 public primary HCFs across 12 districts over three fiscal years. Data from the Facility Financial Accounting and Reporting System and the Planning and Reporting System were analyzed for funding sources, budget utilization, and allocation patterns across seven WASH components.

Results: Four main sources—user fees, basket fund, the Improved Community Health Fund, and the National Health Insurance Fund—accounted for nearly 85% of WASH budgets and expenditures. Local governments, NGOs, and private sector contributions were negligible (<1%). Spending prioritized water supply, hygiene promotion, and infrastructure maintenance. Most funding was internally generated, while vertical programs contributed only 4.4%. Budget utilization improved over time but remained uneven across facility levels.

Conclusion: National policies and direct support budgets have increased WASH expenditure, yet facility-level planning and budgeting remain weak. Financing is heavily reliant on out-of-pocket payments and insurance schemes, with limited external support. To strengthen sustainability and meet SDG targets, WASH must be integrated into core budgeting frameworks, with timely disbursements, stronger managerial capacity, and better policy alignment to enhance financial resilience at the facility level.

KEYWORDS: Water, Sanitation, and Hygiene (WASH); WASH system financing; budgeting; primary healthcare; Sustainable Development Goals (SDGs)

PO-HSS-09

Integrating Non-Communicable Disease Prevention and Management within People-Centred Health Systems: Advancing Universal Health Coverage in Tanzania.

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Background: As Tanzania advances toward Universal Health Coverage (UHC), the rising burden of non-communicable diseases (NCDs) and comorbidities threatens equitable access and health system sustainability.

Despite strong policy commitments, empirical evidence on the implementation and measurable outcomes of integrated, people-centred care remains limited. This study evaluated the implementation processes and outcomes of integrated people-centred NCD care in Tanzania.

Methods: A mixed-methods descriptive-analytical study was conducted. First, a structured document review of national policies, strategic plans, clinical guidelines, and peer-reviewed literature (2015–2024) was undertaken to identify key integration strategies, including community-based screening, task-shifting to primary healthcare workers, and incorporation of mental health and rehabilitation into NCD care. Data were extracted using a standardized framework and synthesized thematically. Implementation was assessed against UHC dimensions—access, quality, and continuity of care—using predefined indicators (service coverage, and follow-up adherence). An embedded clinical case study from Kilimanjaro Christian Medical Centre (KCMC) was used to illustrate real-world application. Patient outcomes were prospectively monitored over 12 weeks using validated measures: Barthel Index (functional status), blood pressure, fasting blood glucose, and treatment adherence. Changes over time were analyzed descriptively. Potential confounders, multimorbidity, and baseline functional status, were considered during interpretation to enhance internal validity.

Results: Integrated people-centred strategies improved access, continuity, and quality of NCD care. Community screening and task-shifting enhanced early detection and service utilization, while integration of rehabilitation and mental health improved functional outcomes and long-term disease management. In the KCMC case (58-year-old male with hypertension, type 2 diabetes, and post-stroke hemiplegia), functional status improved (Barthel Index: 45→80), alongside better blood pressure and glycaemic control and increased adherence.

Conclusion: People-centred integration is feasible and effective for advancing UHC in Tanzania. Strengthening primary healthcare, scaling community-based interventions, integrating rehabilitation and mental health, and improving coordinated care pathways are essential. Further longitudinal and multi-site studies are recommended.

KEYWORDS: Non-communicable diseases; Universal Health Coverage; Integrated care; Health systems strengthening; Mental health; Lifestyle modification; Tanzania

PO-HSS-06

Strengthening the Backbone of Ethical Governance: A Descriptive Appraisal of Administrative Functionality in Tanzanian Health Research Ethics Committees

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Background: Strengthening the backbone of ethical governance is essential to ensuring that health research involving human participants is conducted responsibly and with respect for human rights. Health Research Ethics Committees (HRECs) play a central role in protecting participants and ensuring the ethical conduct of studies. In Tanzania, the quality of ethical review has been evaluated; however, the administrative factors that influence HREC functioning remain underexplored. This study aimed to assess the administrative determinants that shape HREC operations across mainland Tanzania.

Methods: A descriptive cross-sectional survey was conducted among administrators and secretaries from all 10 active registered HRECs. Data were collected using a structured questionnaire and a document review checklist adapted from the African Bioethics Consortium's Research Ethics Committee Assessment Toolkit (RECAT). Descriptive analyses were performed using Microsoft Excel version 26.

Results: Tanzanian HRECs generally maintain structured administrative and review processes, supporting timely ethical review. High compliance was observed in procedural operations and decision-making, whereas gaps were evident in member training (50%), independence safeguards (75%), gender and community representation, infrastructure, and documentation practices. Most committees rely on submission fees, limiting sustainable funding, and only 60% had electronic tracking systems. Compared with developed countries, Tanzanian HRECs

demonstrate weaker independence enforcement, limited professional development, and less integrated digital infrastructure.

Conclusion: Strengthening administrative and infrastructural systems is essential to enhance the quality, transparency, and consistency of ethical review in Tanzanian HRECs. At the national level, the National Institute for Medical Research should establish and enforce minimum standards, ensure sustainable funding, and support integrated digital systems. At the institutional level, HRECs should strengthen internal governance, ensure continuous member training, improve documentation practices, and adopt electronic tracking systems. These measures are critical for safeguarding independence, strengthening participant protection, and building public trust in health research.

KEYWORDS: Health Research Ethics Committees; Ethical Governance; Administrative Functionality; Research Ethics Review

PO-HSS-05

Capacity Building in Health Research Ethics and Regulation: Outcomes and Evaluation of the Good Research Regulatory Practices Training in Eastern Africa.

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Background: Capacity building through training and workshops is essential for improving the quality of health research regulation in sub-Saharan Africa, where inadequate training among Research Ethics Committee members, researchers, and regulators remains widely documented, including in Tanzania. To address these gaps, the Consortium for Clinical Research Regulation and Ethics Capacity in Eastern Africa Region project, through the National Institute for Medical Research and Muhimbili University of Health and Allied Sciences, developed and delivered a four-day Good Research and Regulatory Practice training in 2022.

Methods: A structured end-of-training feedback survey was administered to participants at course completion. The survey used a five-point Likert scale to assess six domains: content relevance, facilitation quality, training resources, knowledge gain, applicability, and overall satisfaction. Descriptive statistics summarized responses.

Results: Thirty-nine participants from five Eastern African countries attended, representing Research Ethics Committee members, researchers, regulators, postgraduate students, and policymakers. The response rate was 95%. Participants rated all domains positively, with mean scores ranging from 3.81 to 4.77. Trainer quality received the highest rating (4.77), followed by overall impression (4.65) and topic relevance (4.62). Participants highlighted interactive delivery and multidisciplinary engagement as key strengths. Common recommendations included extending training duration and increasing frequency.

Conclusion: The training demonstrated high acceptability, relevance, and perceived knowledge gain among diverse stakeholders. It supports integrated, multidisciplinary, in-person approaches as effective capacity-building strategies for strengthening research ethics and regulatory systems in Eastern Africa. **Recommendation:** Future programs should expand duration, scale delivery, and incorporate continuous learning platforms to sustain competencies and enhance regional impact. Further evaluation using longitudinal designs and objective performance indicators is warranted to assess sustained impact on regulatory practices, institutional strengthening, and ethical review quality across participating countries, as well as cost-effectiveness and scalability in resource-limited settings and inform policy decisions.

KEYWORDS: Health Research ethics; Capacity building; Good Research Regulatory Practice; Eastern Africa; CCRREEA project

Enhancing Health Outcomes through Community Systems: Community Health Workers' Role in Early Detection and Differentiated HIV Care among OVC Tanzania

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Introduction: Despite notable progress in HIV response in Tanzania, orphans and vulnerable children (OVC) living with HIV continue to experience disparities in antiretroviral therapy (ART) adherence and viral suppression due to persistent social and structural barriers. Strengthening community systems and implementing differentiated service delivery (DSD) models are critical to sustaining HIV epidemic control. Community Health Workers (CHWs) play a central role in early identification of at-risk clients and facilitation of client-centered care.

Objectives: This case study assesses the effectiveness of a CHW-led, community-based, multi-sectoral intervention implemented under the USAID Kizazi Hodari Project in Njombe Region, focusing on early identification and management of a high-risk pediatric HIV case.

Methodology: A descriptive case study design was applied using routine programmatic and longitudinal case management data. One pediatric client (n=1), aged 8 years, was identified during routine household visits with suboptimal ART adherence linked to inadequate caregiving due to parental alcohol misuse. A differentiated, multi-sectoral intervention was implemented, including placement in alternative care, intensified adherence counseling, nutritional support, and psychosocial services. A pre-post analytical approach was used to assess changes in ART adherence, viral load suppression, and selected social well being indicators over a three month follow-up period.

Results: Post-intervention, ART adherence improved from inconsistent to optimal (>95%) within three months. Viral load testing conducted in March 2026 confirmed viral suppression (Target Not Detected, <50 copies/mL). Additional outcomes included improved nutritional status, stable caregiving environment, school re-enrollment, and sustained access to psychosocial support services.

Conclusion: This case demonstrates that CHW led community systems strengthening and DSD approaches can effectively address complex adherence barriers among OVC. Integrated, community based interventions are essential for improving clinical outcomes and advancing holistic child well-being in resource limited settings.

KEYWORDS: Community Health Workers; OVC; HIV; Differentiated Service Delivery; Viral Suppression; Community Systems Strengthening; Tanzania

Stability of peripheral blood mononuclear cells(PBMCs) under varying cryostorage durations in Tanzania

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Background: Peripheral blood mononuclear cells (PBMCs) are key immune cells used to study T-cell responses and host immunity to infections. Their reliable use requires standardized isolation, proper cryopreservation, and quality monitoring. This study assessed the impact of cryostorage duration on cell recovery, viability, and functional integrity of cryopreserved PBMCs at the NIMR Mbeya Medical Research Centre safety laboratory

Methods: This retrospective study analyzed PBMC quality control data from quarterly assessments of cryopreserved samples over 12 years. PBMCs were isolated, frozen, and thawed to evaluate viability, recovery, and functionality. Cryostorage duration was grouped into ≤ 12 months, 12-36 months, and ≥ 60 months to assess the impact of storage time on PBMC integrity.

Results: A total of 108 PBMC samples were evaluated for apoptosis using Annexin V staining and for antigen-specific functionality via ELISPOT. Recovery rates after thawing remained high (>80-95%) across most cryostorage durations, with stable performance up to 36 months. Viability using Annexin V were varying from 70% to 100%, and cell recovery were generally maintained (>85-95%) up to 50 months. CEF-specific T-cell responses were largely maintained with average of 690 CFU/ml, low variations observed were influenced by prolonged storage (≥ 60 months) and individual staff performance. The overall results show maintenance of functionality, viability and cell recovery over 60 months

Conclusion: The analysis of PBMC samples shows that viability, recovery, and antigen-specific T-cell functionality are largely preserved during cryostorage, demonstrating sustained performance and functional integrity for over 60 months

KEYWORDS: Peripheral blood mononuclear cells(PBMCs); viability; recovery rate and functionality of cells; cryostorage duration

P0-HSS-02

Trends in Laboratory Safety and Quality Indicators: A Three-Year Study from NIMR Mbeya, Tanzania

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AFFILIATIONS

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Background: Healthcare management and the quality of research output depend on laboratories that adhere to international standards, ensuring accurate diagnosis, effective treatment monitoring, patient safety, and disease prevention. Sustained high performance requires robust quality management systems that support continuous monitoring and improvement. In this study, we analyzed three-year trends in critical laboratory safety and quality indicators at NIMR Mbeya, Tanzania.

Methods: A retrospective study was conducted from 2023 to 2025 to assess safety and quality trends at NIMR Mbeya Safety Laboratory, a facility certified by the College of American Pathologists (CAP) since 2007. Five sections (hematology, serology, clinical biochemistry, viral load, and immunophenotyping) were assessed across nine indicators, including proficiency testing, turnaround time, external quality assurance (EQA), staff competency, lot-to-lot verification, safety incidents, equipment maintenance, corrective actions, and inventory control.

Results: Overall proficiency panel results were high: 93.8% for blood count, 90% for blood parasites in hematology, 100% for HIV serology, 83.3% for clinical chemistry, 95.3% for CD4 counts by flow cytometry, and 85.7% for viral load. Turnaround time was 24 hours for hematology, CD4, and clinical chemistry, except for C-reactive protein. Serology and viral load TAT ranged from two weeks to two months, mainly due to reagent shortages. Staff competency assessments, monthly inventory checks, and 36 quality meetings were completed as scheduled. Approximately 70% of preventive equipment maintenance occurred on time, with minor delays for small instruments. No major safety incidents were reported, while CAPA was documented in 80% of EQA runs due to delayed clearance EQA samples affecting the reporting time and sample integrity.

Conclusion: Our study shows that NIMR Mbeya Laboratory maintained strong adherence to quality standards and consistent performance. Nonetheless, reagent shortages, equipment maintenance delays, and EQA challenges highlight the need for improved supply chain management and operational coordination to enhance efficiency and service reliability

KEYWORDS: Laboratory Safety; Quality Indicators; College of American Pathologist Accreditation (CAP).

Strengthening Research Administration Systems in Low-Resource Settings: A Process Evaluation of Institutional Capacity Building in Tanzania

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AFFILIATIONS

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Background /

Introduction: Institutions in low- and middle-income countries (LMICs) face increasing demands to meet complex research funding and compliance requirements. In Tanzania, a high burden of infectious diseases and expanding research activity have outpaced the development of institutional research administration systems. Strengthening these systems is important to support grant competitiveness, regulatory compliance, and institutional sustainability.

Methods: A qualitative-dominant mixed-methods process evaluation was conducted using the Medical Research Council (MRC) framework for complex interventions. Data were collected through semi-structured interviews, focus group discussions, document review, and routine program monitoring. The intervention included structured training, mentorship, development of standard operating procedures (SOPs), and establishment of an Office of Sponsored Projects (OSP) to support the full grant lifecycle. Quantitative indicators, including training completion, application submission rates, and applied outputs, were triangulated with qualitative findings to assess implementation processes and outcomes.

Results: All trainees completed core and specialized training across pre-award, post-award, and finance/compliance domains. Ongoing mentorship was sustained through regular virtual and in-person sessions. The program was associated with 13 grant proposal submissions, support for two reporting cycles, and the development of 15 standardized tools and procedures for research administration. Adaptive implementation strategies, including flexible scheduling and hybrid delivery, helped address challenges related to workload, staffing, and institutional processes.

Conclusion: The integration of training, mentorship, and systems development was associated with improvements in research administration processes and capacity in this setting. Leadership engagement, strategic partnerships, and context-responsive adaptations appeared to support implementation. Further research is needed to assess long-term sustainability and to explore approaches for scaling and institutionalizing such capacity-building models in similar low-resource contexts.

KEYWORDS: Research administration; Capacity building; Low- and middle-income countries; Process evaluation; Implementation research

Metabolic Healthy Drink: A Clinically-Inspired Functional Beverage for Adjunctive Support in Metabolic Disorders (Poster Presentation)

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Background: In alignment with the World Health Organization's framework for integrating evidence-based complementary medicine into health systems, the global rise of metabolic disorders—including hypertension, dyslipidemia, insulin resistance, and obesity—demands innovative lifestyle interventions alongside standard care. This need led to the development of Metabolic Healthy Drink, a ready-to-drink functional beverage with a six-

ingredient blend recognized as safe by international authorities for multi-targeted action against metabolic pathophysiology.

Methods: This synergistic combination features beetroot to support vascular health through nitric oxide pathways, improving endothelial function and blood pressure regulation. Ginger stimulates thermogenesis and metabolic activation, enhancing energy expenditure and glucose utilization. Turmeric oleoresin modulates systemic inflammation via NF-κB inhibition—a key driver of metabolic disorders—while providing antioxidant protection against oxidative stress. These effects are complemented by hibiscus, which provides ACE-inhibiting cardiovascular support, reducing hypertension risk. Lemon contributes immune-supporting vitamin C and aids in iron absorption, supporting overall metabolic health. Finally, black pepper is included as a bioavailability enhancer, increasing curcumin absorption by up to 2000%, ensuring therapeutic efficacy of the turmeric component.

Results: All six ingredients possess documented safety profiles supported by historical consumption, toxicological studies, and international regulatory evaluations. Each has been used traditionally in food systems and continues to be incorporated into modern dietary applications without safety concerns. The 300mL serving size delivers standardized bioactive concentrations optimized for daily adjunctive use, providing a convenient and consistent dosage for consumers seeking metabolic support.

Conclusion: By integrating these clinically-researched bioactives into a convenient beverage, the formulation addresses a significant market gap, offering adults a practical, scientifically-validated tool for proactively managing components of metabolic disorders as adjunctive support alongside medical guidance and balanced nutrition. This innovative product bridges traditional food wisdom with contemporary nutritional science.

KEYWORDS: Metabolic disorder; functional beverage and adjunct support

PO - CANC - 03

Endoscopic and Clinical Patterns of Esophageal Tumors at Tanga Regional Referral Hospital, Tanzania

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AFFILIATIONS

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Background: Esophageal tumors remain a major global health concern due to their high mortality and late-stage presentation. The burden is particularly significant in sub-Saharan Africa, including Tanzania, where limited local epidemiological data hinder effective prevention and management strategies. This study aimed to assess the prevalence, endoscopic presentation, and associated risk factors of esophageal tumors among patients undergoing diagnostic endoscopy at Tanga Regional Referral Hospital.

Methods: A retrospective cross-sectional study was conducted using hospital records of patients aged 18 years and above who underwent endoscopic examination between July 2022 and July 2024. Data were extracted from patient registers and analyzed using descriptive statistics and inferential methods to determine associations between esophageal tumors and selected demographic and lifestyle factors. Adjusted odds ratios (AORs) with 95% confidence intervals (CI) were used to measure the strength of associations.

Results: A total of 246 patients were included in the analysis. The overall prevalence of esophageal tumors was higher among individuals aged at least 50 years among males, although these associations were not statistically significant. Endoscopic findings showed that a substantial proportion of patients had non-tumor diagnoses, while tumor-related features such as mass lesions and bleeding were observed in a notable subset. Smoking was significantly associated with increased odds of esophageal tumors (AOR = 2.92, 95% CI: 1.51–5.62), while individuals who underwent biopsy had markedly higher odds of confirmed tumors (AOR = 15.66, 95% CI: 7.81–31.42). Most low-fat diets, were also significantly associated with tumor occurrence.

Conclusion: This study highlights the considerable burden of esophageal tumors in the study setting, with distinct clinical and endoscopic patterns. Smoking and dietary factors emerged as important modifiable risks, while biopsy remains critical for definitive diagnosis. Strengthening early detection strategies and promoting

targeted prevention efforts are essential to reduce the impact of esophageal tumors in this region.

KEYWORDS: Endoscopic Tumor Tanzania

Maternal, Child, Adolescent, and Reproductive Health

36 Abstract(s)

OR-CANC-03

Distribution of Pharmacogenomic Variants and Clinical Correlates of Chemotherapy-Induced Toxicities in Pediatric Cancer Patients in Tanzania. A cross-sectional study

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3. Duke University Health Institute

Background: Chemotherapy-induced toxicities present a significant challenge in pediatric oncology, leading to treatment interruptions, morbidity, and reduced survival rates in low-resource environments. The variability in genetic profiles plays a critical role in drug metabolism, transport, and detoxification. However, data are scarce regarding the genetic profiles of African children undergoing chemotherapy. This study aims to explore the distribution of selected pharmacogenomic variants and their clinical correlates in relation to chemotherapy-induced toxicities in Tanzania.

Methods: A cross-sectional study was successfully conducted involving 155 pediatric cancer patients aged 1-17 years who were receiving chemotherapy at Bugando Medical Centre. The research gathered an extensive array of clinical data, clinician-observed toxicities, patient-reported outcomes, and blood samples for SNP genotyping. Eleven pharmacogenomic variants across crucial drug-metabolism pathways, including CYP3A5, SLC19A1, TPMT, NUDT15, GSTP1, NCF4, CYBA, and CEP72 were meticulously genotyped using the Agena MassARRAY® platform. The assessment of toxicities adhered to the Common Terminology Criteria for Adverse Events version 5.0.

Results: Hematologic toxicities, including anemia (50.3%), and leukopenia (37.4%), along with mucocutaneous toxicities such as alopecia (38.1%) and oral ulcers (24.5%) were prevalent. Vincristine-related peripheral neuropathy, characterized by diminished muscle strength, impacted 78.1% of the patient population. The gene variants, TPMT2, TPMT3B, and NUDT15, demonstrated monomorphic characteristics. Carriers of CYP3A5*6 constituted 38.1%, and CYP3A5*3 carriers represented 27.7%, indicating a widespread reduction in CYP3A5 enzymatic function. The GSTP1 rs1695 was highly polymorphic, with a minor allele frequency (MAF) of 0.46, while significant variation was also noted for CYBA rs4673 (63.9% carriers) and NCF4 rs1883112 (23.2% carriers). The SLC19A1 rs1051296 variants showed nearly equal allele distribution (MAF 0.49), implying considerable interindividual variability in the transport of methotrexate.

Conclusion: The current study offers critical baseline data on pharmacogenomic variation among Tanzanian children with cancer, revealing considerable diversity in genes associated with drug metabolism and susceptibility to toxicity.

KEYWORDS: Pharmacogenomics; genetic polymorphism; Chemotherapy-induced toxicities; Childhood cancers; Drug-related adverse effects; Tanzania

OR-CANC-05

Characterization of acute leukemia in children below 15 years at Kilimanjaro christian medical center in northern Tanzania

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Introduction: Acute leukemia is a leading cause of childhood cancer morbidity and mortality worldwide, yet comprehensive subtype characterization remains limited in low-resource settings. Globally, leukemia diagnosis is more precise compared to low- and middle-income countries (LMICs), where reliance on morphology may limit accurate risk-stratified therapy. At Kilimanjaro Christian Medical Centre (KCMC), diagnosis has historically depended on morphology, which may lack the precision required for evidence-based clinical decision-making.

Methods: We conducted a quantitative cross-sectional study involving 100 children under 15 years suspected of acute leukemia. Following the completion of informed consent and patient assent, blood samples were drawn from each participant. Collected samples underwent peripheral blood smear (PBS) examination and multiparametric flow cytometry (FC) to detect cell surface and cytoplasmic markers. Data were analyzed using SPSS version 26 to assess leukemia subtypes and marker expression patterns.

Results: Seventy-five percent of participants were male, with the largest proportion aged 10–15 years (42%). FC identified Acute Lymphoblastic Leukemia (ALL) in 78% of cases, comprising B-cell ALL (52%) and T-cell ALL (26%), while Acute Myeloid Leukemia (AML) accounted for 22%. The most frequently expressed B-lineage markers were CD19 (53%), CD10 (43%), and CD20 (43%), whereas cCD3 (26%) and sCD3 (23%) characterized T-lineage ALL. Morphology detected blasts in 96% of cases, but FC provided definitive lineage classification, particularly in morphologically ambiguous T-ALL cases, highlighting its critical diagnostic value in resource-limited settings.

Conclusion: B-cell ALL is the predominant subtype among pediatric patients at KCMC. Incorporating FC significantly enhances diagnostic precision beyond morphology alone. Routine immunophenotyping in LMIC settings is essential to guide accurate, subtype-specific therapy, improve patient outcomes, and strengthen evidence-based pediatric oncology practices.

KEYWORDS: pediatric leukemia; acute lymphoblastic leukemia; acute myeloid leukemia; flow cytometry; Tanzania

OR-CANC-10

Explore perceived facilitators and barriers towards HPV self-sampling for cervical cancer screening among women, healthcare providers, and community health workers in Kilimanjaro Region, Tanzania: A qualitative study

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5. Kilimanjaro Christian Medical Centre

6. Kilimanjaro Clinical Research Institute

Background: Cervical cancer is the leading cause of all cancer-related deaths among women in low and middle-income countries. Screening through HPV self-sampling detects the virus that causes cervical cancer and empowers women to collect their own samples in a clinic or in their community. However, there is limited evidence on the barriers and facilitators that influence the uptake of HPV self-sampling in Tanzania.

Methods: We conducted a qualitative descriptive study with Focus Group Discussions among Community Health Workers and In-depth interviews among healthcare providers and women (screened and unscreened). An interview guide was used. Data was analyzed using inductive thematic analysis using NVivo 12.

Results: Two Focus Group Discussions conducted among fifteen Community Health Workers (8 from urban, and 7 from rural areas); In-depth interviews were conducted among seven healthcare providers and fifteen women (8

screened and 7 unscreened). Three major facilitators emerged: perceived privacy and confidentiality, convenience of home-based screening, and supportive community engagement through CHWs and peers. Amongst barriers include fear of test results, concerns about performing the procedure correctly or causing harm, limited knowledge and misconceptions about HPV self-sampling, stigma, and lack of spousal support.

Conclusion: Increasing awareness and education on HPV self-sampling among both healthcare providers and communities may enhance screening uptake and early detection of cervical cancer. Strengthening the capacity of community health workers to deliver education and support may facilitate successful community-based HPV self-sampling programs.

KEYWORDS: Cervical cancer; HPV Self-sampling; Cervical cancer screening; Community health workers; Tanzania.

OR-CANC-12

Durability of immune responses following single dose HPV vaccination among Tanzanian girls: Evidence from the DoRIS Trial

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Background: Human papillomavirus (HPV) vaccination is central to global cervical cancer elimination. The World Health Organization (WHO) recommends a single-dose schedule for individuals aged 9–20 years; however, country-level policy decisions require robust long-term immunogenicity data. This study evaluates the durability of immune responses following single-dose HPV vaccination among Tanzanian girls.

Methods: The Dose Reduction Immunobridging and Safety Study (DoRIS) is an open-label, randomized controlled trial conducted in Mwanza, Tanzania. 930 HIV-negative girls aged 9–14 years were randomized to receive one, two, or three doses of the bivalent (Cervarix®) or nonavalent (Gardasil®9) HPV vaccines. HPV16/18 immune responses were assessed in one- and two-dose arms up to 60 months post-vaccination using a VLP ELISA. In the Gardasil®9 arms, antibody responses to the 9 vaccine-related HPV types (HPV6, 11, 16, 18, 31, 33, 45, 52, and 58) were measured up to month (M)36 using a multiplex immunoassay.

Results: At M60, HPV16 seropositivity exceeded 99% in the single-dose arms for both vaccines and was non-inferior to the two-dose schedule. HPV18 seropositivity remained high (93–98%) but did not meet non-inferiority criteria. Single-dose HPV16/18 antibody geometric mean concentrations (GMC) plateaued by M12 and remained stable through M60, with comparable antibody avidity between one and two doses at M36. Over 96% of single-dose Gardasil®9 recipients were seropositive for HPV11, HPV18, and HPV33 at M36, and 73–88% were seropositive for HPV6, HPV45 and HPV52. GMCs for all nine HPV types plateaued by M12 and remained stable through M36.

Conclusion: A single dose of HPV vaccine in young girls induces durable immune responses for at least five years. These findings provide locally-generated evidence to inform Tanzania's Ministry of Health in optimizing HPV vaccination policy. Adoption of a single-dose schedule could improve coverage and accelerate progress toward cervical cancer elimination in resource-limited settings.

KEYWORDS: HPV vaccine; clinical trial; cervical cancer

OR-CANC-13

COVID-19 rumours, trust and influence on male HPV-vaccination uptake in the add-vacc trial, northwest Tanzania

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AFFILIATIONS

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Background: The COVID-19 pandemic impacted public health services and vaccination uptake in many countries. Trust in health services and vaccination programmes plays a crucial role in vaccination acceptance. Between 2020 and 2022, Tanzania experienced a shift in COVID-19 acknowledgement and prevention strategies. National COVID-19 vaccination coverage increased to 51% by April 2023. The Add-Vacc cluster-randomised trial (CRT) provided single-dose HPV vaccination to 14-18-year-old males in 2023-2024. This is the first-time male HPV vaccination has been offered in Tanzania.

Methods: We explored vaccination rumours and concerns, including those related to COVID-19 to determine their influence on HPV male vaccination uptake.

Methods: From May 2023 to January 2024, field team collected vaccine rumours data using a piloted electronic-rumours tool, interviews, focus group discussions, and rapid ethnography with vaccination stakeholders including adolescents, parents, teachers, health workers and community leaders. We used thematic analysis involving iterative transcripts reviewing and coding based on topic guides and emerging themes, supported by NVivo 12 software.

Results: Rumours reported by community members, including young people, indicated some mistrust of single-dose male HPV vaccination, with some stating the vaccine was a concealed COVID-19 vaccine. Rumours data revealed that shifting policies regarding COVID-19 vaccines between 2020 and 2022 and introduction of the vaccine into an unfamiliar population prompted concerns leading to hesitancy in accepting the trial vaccine. Dynamic, ongoing community engagement rapidly addressing rumours supported trial vaccine uptake.

Conclusion: Mistrust related to shifting COVID-19 policies during the height of the global pandemic continued to influence trial community members' and participants' trust during a CRT offering single-dose HPV vaccination to young men. Multi-level strategies that build trust across vaccine stakeholder groups and vaccination programmes could enhance acceptance of single-dose HPV vaccination of young men in a context where there is ongoing mistrust of new vaccines or vaccination strategies.

KEYWORDS: COVID-19; Rumours; Trust; Male HPV Vaccination

OR-DIG-12

"I realized that staying silent out of shame actually causes harm": The impact of a blended-Digital Parenting programme on Caregiver-adolescent sexual risk communication and prevention of child abuse in Tanzania

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Introduction: Adolescent aged 10-17 face multiple forms of abuse including sexual violence. Parenting programmes have improved caregiver-adolescent relationships through multiple dimensions of parenting and a key one being communication. However, there is dearth of knowledge on the impact of blended-digital parenting programmes on sexual violence prevention.

Objective: We set out to understand parent-child communication dynamics on the adolescent sexual risk behaviour and on the prevention of sexual abuse among adolescents aged 10-17 years.

Methods: We employed qualitative research design involving 60 in-depth interviews with caregivers (N=30) and their adolescents aged 10-17 year (N=30) who had participated in the ParentApp-Teens programme involving 14 modules, delivered over 14-weeks. The sessions had an integrated sexual violence prevention content with effective strategies to build habits, reduce conflict, and support positive parenting. Data was analyzed with the aid of NVIVO 14 qualitative data analysis software.

Results: The analysis revealed four themes: 1) Caregiver-adolescent communication about sexual risk environment; 2) Prevention of sexual abuse; 3) Gender differences in caregiver communication about sexual risk; 4) overcoming social norms on communication about sexuality and sexual abuse. There were gender differences in caregiver-adolescent communication about risk and prevention of violence. While caregivers frequently communicated with their daughters about risky places and situations to avoid, they rarely did this for the male children. Caregivers perceived male children as not at risk of sexual abuse. Caregivers communicated with their daughters on prevention of sexual violence by not engaging in risky sexual behaviour. Caregivers reported that the blended-digital parenting programme helped them to overcome stigma that hindered communication about sexual risk.

Conclusion: A blended -digital parenting intervention (ParentApp-Teens) improved caregiver-adolescent communication about sexual risk environment and behaviours. ParentApp-Teens programme should be scaled up in Tanzania and beyond to reach all caregivers who need skills on the prevention of sexual violence.

KEYWORDS: Blended-Digital Parenting programme; Caregiver-adolescent sexual risk communication; Child abuse; Tanzania

OR-DIG-13

Acceptability of a blended-Digital Parenting intervention to Prevent violence against adolescents in Tanzania: Implications for digital parenting interventions

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Introduction: Violence against children (VAC) is a major public health issue with short and long-term consequences for children, families and societies. In as much as parenting interventions are effective at reducing and preventing VAC, caregivers encounter challenges related to human delivery.

Objective: To explore caregivers and adolescent views on relevance, acceptability, satisfaction, and usability of an app-based parenting intervention (ParentApp) delivered in a low-resource setting in Tanzania.

Methods: This paper draws from qualitative interviews conducted with 21 caregivers and 18 adolescents. Participants were sampled purposely based on engagement levels in digital parenting intervention (ParentApp). Semi-structured interviews focused on caregiver and adolescent experiences with the app, motivation, relevance, and challenges of using the app. Thematic analysis was conducted with the aid of NVIVO 14 qualitative data analysis software.

Results: Three themes emerged: 1) Acceptability and relevance of the app-based intervention; 2) motivation to use the app; 3) Challenges using the app. There was widespread acceptability of the digital parenting intervention. Caregivers reported that the modules were relevant to their cultural norms on parenting. They were motivated to continue using the app after seeing benefits in their relationships with their adolescents that were attributed to the use of the app. Caregivers and adolescents liked the structure of the sessions. However, caregivers reported encountering challenges that hindered their engagement with the app. Examples of these are: busy school schedules that hindered caregiver-teen app time together; lack of electricity to charge mobile phones and; caregiver limited digital literacy thus needing support to navigate the app. **Conclusions/Recommendation:** It is feasible to deliver a digital parenting intervention in a low-resource setting like Tanzania. The ParentApp programme was acceptable, relevant to the parenting needs of caregivers. However, caregivers from low-resources settings may benefit from digital support to effectively engage and use the app with their adolescents.

KEYWORDS: Acceptability; Blended-Digital Parenting intervention; Violence; Adolescents; Tanzania

Prevalence and factors associated with help-seeking behavior among female youth who experienced Intimate Partner Violence in Tanzania, 2015/16 and 2022

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Background: Intimate Partner Violence (IPV) remains a significant global public health concern, with youths disproportionately affected compared to the general population of women aged 15-49 years. In Tanzania, nearly one in two (47.8%) female youth reported having experienced IPV in 2015. Despite national interventions, help-seeking behavior among this group remains low.

Methods: The study was an analytical cross-sectional study design, utilizing data from the 2015/16 and 2022 Tanzania Demographic and Health Surveys. Descriptive statistics were used to estimate the prevalence of help-seeking behavior and sources of help used, while Modified Poisson regression was used to determine factors associated with help-seeking behavior among female youth who experienced IPV within the 12 months preceding the survey. Statistical significance was set at a p-value of ≤ 0.05 .

Results: Findings showed a significant decline in help-seeking behavior from 52.0% in 2015/16 to 34.1% in 2022 (p-value<0.001). Most youth sought help from informal sources such as their own or partner's family, while formal sources (medical personnel, police and social welfare organizations) were least utilized. Help-seeking behavior was significantly associated with belonging in the rich wealth index (aPR=1.76; 95%CI: 1.05-2.97), working (aPR=1.82; 95%CI: 1.15-2.88) and being younger than the spouse.

Conclusion: These findings highlight the need to strengthen programs that promote family engagement in IPV awareness and response. Interventions should also address cultural norms that discourage seeking help outside the family, particularly those driven by stigma and fear of judgement. Youth who are not in school should be economically empowered to reduce dependence on intimate partners, as increased economic autonomy can enhance their capacity and willingness to seek help and exit violent relationships.

KEYWORDS: Help-seeking behavior; intimate partner violence; youth; Tanzania

Mobilizing Communities to Advance Respectful Maternal and Newborn Care in Tanzania: Evidence from the Uzazi Staha Project in Mwanza.

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8. Prime Minister's Office Regional Administration and Local Government (PMO-RALG)

Background: Disrespect and abuse during childbirth remains a barrier to maternal and newborn health service utilization. Social accountability interventions like the Community Score Card (CSC) can improve community participation, provider accountability, and service quality. The Uzazi Staha Project applied the CSC approach to strengthen respectful maternal, newborn, and child health (MNCH) services.

Methods: A mixed-methods evaluation was conducted in three districts across six facilities to assess the CSC’s contribution to improving respectful MNCH service utilization. The intervention engaged communities, health workers, and leaders through facilitated dialogue, joint problem identification, and action planning. Data sources included document review, DHIS2 data analysis (2021–2024), key informant interviews, and focus group discussions with 183 participants. Qualitative data were analyzed thematically; descriptive statistics and trend analysis examined changes in MNCH indicators.

Results: MNCH service utilization improved across several indicators. PNC within 48 hours increased markedly, including at Itabagumba (58% in 2021 to 99.1% in 2024) and Isamilo (34% to 98%). Nyerere and Igoma achieved 100% PNC coverage by 2024. First antenatal care attendance rose at Isamilo Dispensary (55% to 77%). Institutional deliveries remained consistently high, generally above 95%, with Nyerere reaching 100% in 2024. Qualitative findings indicated that CSC strengthened community participation in monitoring services, improved communication between communities and providers, and increased male engagement in ANC visits. Community members reported improved awareness of their rights to respectful care and greater confidence in raising concerns. CSC action plans addressed provider attitudes, clinic schedules, and outreach activities. Persistent challenges include HRH shortages, infrastructure limitations, transportation barriers, and out-of-pocket costs for diagnostics.

Conclusion: The Uzazi Staha Project demonstrates that community mobilization through CSC can strengthen community-provider relationships, enhance accountability, and improve MNCH service utilization. Institutionalizing CSC within government systems while addressing health system constraints is essential for sustaining gains in respectful maternal and newborn care.

OR-MCH-02

Health-Seeking Behaviour and Barriers to Timely Access to Obstetric Fistula Services in Mwanza and Geita Regions, Tanzania: A Mixed-Methods Study.

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Background: Obstetric fistula is a preventable childbirth injury caused by prolonged obstructed labor, leading to continuous leakage of urine or feces with severe physical and social consequences. Globally, an estimated 2–3.5 million women live with obstetric fistula and 50,000–100,000 new cases occur annually (WHO, 2017). In Tanzania, approximately 21,400 women are living with untreated fistula and about 2,500–3,000 new cases occur each year, particularly in rural regions such as Mwanza and Geita (Cichowitz, 2018). Despite available treatment, awareness and access barriers persist.

Methods: Americares, in collaboration with the Ministry of Health and PMO-RALG, conducted a mixed-method cross-sectional study in Mwanza and Geita to assess knowledge, attitudes, and barriers to obstetric fistula services. Quantitative data came from household surveys with 505 adults aged 15–65 across four councils and

eight villages. Qualitative data included 36 key informant interviews and eight focus group discussions. Analysis used descriptive statistics, chi-square tests, and inductive thematic analysis, with triangulation of findings.

Results: Only 33% of 505 respondents had heard of obstetric fistula. Among those aware (n=165), 38% demonstrated high knowledge (scoring $\geq 50\%$ on causes, symptoms, prevention, and treatment). 44% showed positive attitudes toward affected women and interventions. Awareness was significantly higher among women, educated individuals, employed persons, urban residents, and those living within 30 minutes of a health facility. Qualitative findings revealed misconceptions linking fistula to witchcraft or curses, fueling stigma and social isolation. Barriers included poverty, distance to facilities, limited male involvement, and reliance on traditional healers. Community health workers and religious leaders facilitated awareness and referrals.

Conclusion: Awareness and understanding of obstetric fistula remain low in Mwanza and Geita, with stigma and structural barriers delaying care. Strengthening community education, male engagement, and behavior change communication is essential to improve access to services and support Tanzania's goal of eliminating obstetric fistula.

OR-MCH-03

Sexual Health Awareness and Condom Knowledge as Determinants of Risky Sexual Behaviours among Primary School Adolescents in Tanzania: A Cross-Sectional Analysis

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Background: Adolescent sexual and reproductive health is a major concern in Tanzania, where early sexual debut, limited sexual health knowledge, and risky behaviours increase vulnerability to unintended pregnancies and infections. Life skills, particularly self-awareness and decision-making, may influence adolescents' capacity to navigate sexual risks. This study examined associations between life skills, sexual health awareness, condom knowledge, and risky sexual behaviours among primary school adolescents in Dar es Salaam.

Methods: A cross-sectional survey was conducted among 400 adolescents aged 10–16 years using a structured, self-administered questionnaire. Life skills were assessed with the Life Skills Assessment Scale, and sexual health awareness, condom knowledge, and risky sexual behaviours were measured using validated instruments. Descriptive statistics, independent samples t-tests, and regression were used for the analyses.

Results: Most adolescents reported high self-awareness (58%) and low decision-making skills (56%). High condom knowledge was observed in 72%, while sexual health awareness remained low (78%). Risky sexual behaviours were reported by 14%. Significant gender differences were observed for condom knowledge ($t = -4.83$, $p < .001$) and risky sexual behaviours ($t = -5.16$, $p < .001$), with males reporting higher engagement in risky behaviours. Age differences were significant for condom knowledge ($t = 4.42$, $p < .001$) and risky sexual behaviours ($t = 2.66$, $p = .008$), while self-awareness, decision-making, and sexual risk awareness did not differ by gender or age. Regression analysis showed self-awareness predicted sexual health awareness, and decision-making predicted condom knowledge. Neither life skill predicted risky sexual behaviours, whereas older age and male gender were significant predictors.

Conclusion: Self-awareness and decision-making enhance sexual health awareness and condom knowledge but do not independently predict risky behaviours, which are strongly influenced by age and gender. Interventions targeting life skills and age- and gender-specific factors may improve sexual health outcomes among primary school adolescents.

“Children Parenting Children”: Adolescent mothers navigating parenting and Implications for Early Child Development in Tanzania

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Introduction: Evidence shows that parenting programmes are effective at improving Early Child Development (ECD) outcomes. However, adolescent mothers may struggle to remain meaningfully involved in the parenting of their children.

Objective: : To understand the parenting needs for adolescent mothers (aged 14-18 years) with children aged 0-3 years and to explore the challenges faced as they navigate parenting.

Methods: We conducted a total of 20 in-depth interviews and 6 FGDs (N= 60) with adolescent mothers of children aged 0-3 years. Adolescent mothers were sampled through purposive and snowball sampling. Data collection focused on adolescent mothers' parenting needs, challenges of parenting and mental health situation. Data was analysed thematically.

Results: Four themes emerged: 1) Adolescent mothers' experience with unplanned pregnancy; 2) Adolescent mothers' parenting needs and child stimulation; 3) Adolescent mothers living in poverty and struggling to provide for their children; 4) Mental health state of adolescent mothers. Adolescent mothers reported that they lacked knowledge of the process of labour and childbirth and suffered trauma due to family rejection and abandonment. Childbirth trauma, coupled with the stigma of having a child at a young age and out of marriage, heavily impacted their experience of motherhood and how they interacted with their children, leading to a low connection that could affect child stimulation and development. Adolescent mothers reported living in poverty and depending on sexual partners through transactional sex to fend for their children's needs, further perpetuating their risk for other unplanned pregnancies and Sexual and Reproductive Health challenges (e.g. STIs and HIV). **Conclusions/Recommendations:** Adolescent mothers experience trauma as a result of societal stigma, lack of parenting and ECD knowledge and limited financial resources. These factors impact ECD and ultimately child outcomes. There is a need for parenting and SRH support for adolescent mothers for improved child development.

KEYWORDS: Adolescent mothers; Parenting; Early Child Development; Tanzania

Antenatal Care Utilisation in Tanzania: A Poisson Regression Analysis of the Tanzania Demographic Health Survey 2022.

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Background: Antenatal care is crucial for safeguarding maternal and child health. In Tanzania, despite improvements in healthcare services, many women still do not complete the recommended minimum of four ANC visits.

Methods: This study explored the socioeconomic and demographic determinants of ANC utilisation using data from the 2022 Tanzania Demographic and Health Survey (TDHS). A cross-sectional analysis was conducted using

nationally representative data for women aged 15–49 who had a live birth within five years preceding the survey. Poisson regression was applied to identify factors associated with the number of ANC visits. Model fit was evaluated using Deviance and Pearson Goodness-of-Fit tests.

Results: Results showed that 89.26% of women attended at least one ANC visit, but only 61.26% completed four or more visits. Higher maternal education (IRR = 1.3002, $p < 0.001$) and greater household wealth—poorer (IRR = 1.0959), middle (IRR = 1.1277), richer (IRR = 1.1624), and richest (IRR = 1.2514) were significantly associated with increased ANC visits (all $p < 0.001$). Larger household sizes were negatively associated with ANC use. Regional disparities were also evident, with women in the Central, Southern, Eastern, and Zanzibar zones more likely to attend ANC than those in the Western zone. Goodness-of-fit tests confirmed that the model adequately fit the data (Deviance $p = 0.2679$; Pearson $p = 0.9901$). Conclusion

Conclusion: while ANC contact is high, completion of recommended visits remains low. Strengthening education, economic support, and healthcare access—especially in underserved regions is essential to improve ANC coverage in Tanzania.

KEYWORDS: Antenatal care; Poisson regression; Maternal Health; TDHS 2022; ANC Utilization; Socioeconomic Factors

OR-MCH-06

Barriers to antenatal care access among rural women in Tanzania

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Background: Tanzania's maternal mortality ratio remains persistently high at 556 deaths per 100,000 live births, with rural women disproportionately affected. While antenatal care (ANC) can prevent 75% of maternal deaths, only 43% of rural Tanzanian women receive the recommended four visits compared to 72% in urban areas. Achieving Universal Health Coverage (UHC) and Tanzania's Development Vision 2050 requires addressing this inequity. This research systematically maps the socioeconomic, cultural, geographic, and health system barriers preventing rural women from accessing ANC services.

Methods: Systematic searches were performed across PubMed, Scopus, CINAHL, African Journals Online, and Google Scholar for publications between January 2015 and December 2024. Grey literature from Tanzania's Ministry of Health, WHO, and relevant NGOs was included. The PCC framework guided inclusion: Population (rural Tanzanian women aged 16–45), Concept (barriers to ANC access), and Context (rural Tanzania and comparable Sub-Saharan African settings).

Results: The search yielded 847 records, of which 42 studies met inclusion criteria. Four interconnected barrier domains emerged: (1) Geographic barriers including distance to facilities (mean 8.7 km in rural areas), poor road infrastructure, and lack of affordable transport; (2) Economic barriers comprising direct costs (consultation fees, supplies) and indirect costs (lost daily wages, transport expenses); (3) Cultural and gender-related barriers including spousal control over healthcare decisions, traditional birth attendant preference, and stigma toward adolescent pregnancy; and (4) Health system barriers including severe staff shortages, stock-outs of essential supplies, disrespectful care, and long waiting times. Regional disparities are most pronounced in the Lake Zone (Mwanza, Shinyanga, Simiyu) where ANC attendance falls below 58%.

Conclusion: Barriers to ANC access in rural Tanzania are systemic and mutually reinforcing, not individual failures. Addressing them requires a multi-sectoral approach including community-based transport schemes, task-shifting to address workforce shortages, gender-transformative programming engaging men as partners, and strengthened primary healthcare infrastructure.

KEYWORDS: Antenatal care; ANC access; rural women; maternal health.

Satisfaction with Postnatal Health Care Services and Associated Factors among Women in Tanzania

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Background: The postnatal period is a critical phase for maternal and newborn survival, yet the quality of postnatal care (PNC) remains suboptimal in many low- and middle-income countries. Women's satisfaction is an important indicator of healthcare quality and influences continued utilization of maternal health services. In Tanzania, existing studies have largely focused on postnatal care utilization rather than women's satisfaction with services. This study aimed to assess postnatal care satisfaction and its associated factors among postnatal women attending care in Tanzania.

Methods: A hospital-based cross-sectional study was conducted among postnatal women using simple random sampling. Postnatal care satisfaction was measured using an adapted Jipi's Postnatal Satisfaction with Nursing Care Questionnaire (JPSNQ). Descriptive statistics were used to determine prevalence, and log-binomial regression analysis was performed to identify factors associated with PNC attendance. Adjusted prevalence ratios (aPRs) with 95% confidence intervals (CIs) were reported, with statistical significance set at $p < 0.05$.

Results: The prevalence of postnatal care satisfaction was 45.5%. Urban residence (aPR = 1.548; 95% CI: 1.174–2.040), being married (aPR = 1.364; 95% CI: 1.023–1.819), and antenatal care attendance (aPR = 1.417; 95% CI: 1.080–1.858) were independently associated with higher satisfaction. Longer waiting time at the health facility (aPR = 0.696; 95% CI: 0.543–0.892) and experiencing delivery complications (aPR = 0.741; 95% CI: 0.556–0.987) were associated with reduced satisfaction.

Conclusion: Postnatal care satisfaction among women was moderate, with fewer than half of participants reporting satisfaction. Socio-demographic, health system, and obstetric factors played a significant role in shaping women's experiences. Strengthening service efficiency, improving continuity of care, and enhancing supportive care for women experiencing complications are essential to improve postnatal care quality and maternal health outcomes in Tanzania.

KEYWORDS: Postnatal care; Postnatal care satisfaction; Maternal health; Quality of care; Tanzania

"I would breastfeed and I would tolerate the pain until I would cry" A QUALITATIVE STUDY EXPLORING UNFINISHED JOURNEYS OF EXCLUSIVE BREASTFEEDING IN TANZANIA

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Background: Exclusive breastfeeding for the first six months of life is a highly effective intervention in reducing infant morbidity and mortality. Adherence to exclusive breastfeeding for six months among Tanzanians is suboptimal despite breastfeeding being widely accepted and high knowledge of recommended practices. Understanding why women who intend to exclusively breastfeed are unable to do so is essential for designing effective interventions.

Methods: We conducted a qualitative study using an interpretive phenomenological approach to explore lived experiences of women who intended to exclusively breastfeed for six months but discontinued earlier. Twenty-

one mothers with infants younger than one-year were purposively recruited from an urban tertiary hospital in Dar-es-Salaam and a semi-urban district hospital in Bagamoyo. Data were collected through semi-structured in-depth interviews, audio-recorded, transcribed verbatim, and analysed using hybrid thematic analysis guided by Social Ecological Model of health.

Results: Women described a complex set of interconnected barriers to exclusive breastfeeding operating across multiple levels of healthcare network. At the individual level, infant breast refusal, persistent crying interpreted as hunger, painful or cracked nipples, and perceived insufficient milk supply led to early supplementation. At the interpersonal level, feeding decisions were strongly influenced by family members and elders, often within emotionally stressful and blaming home environments. Community-level barriers involved conflicting health advice, formula exposure in facilities, ineffective breast pumps, and unsupportive work environments. At the policy level, short maternity leave and poor enforcement of breastfeeding regulations further constrained women's ability to sustain exclusive breastfeeding for six months.

Conclusion: Exclusive breastfeeding in Tanzania is shaped by multilevel and interrelated barriers that extend beyond individual maternal knowledge or motivation. Developing a health workforce skilled in lactation support, engaging families and communities, improving workplace support, and aligning maternity protection policies with global breastfeeding recommendations are essential to enable women to achieve six months of exclusive breastfeeding.

KEYWORDS: Exclusive breastfeeding; qualitative study; Social Ecological Model; maternal health; infant feeding; barriers

OR-MCH-09

Early breastfeeding challenges and associated risk factors among first-time mothers in Dar es Salaam & pwani regions of Tanzania

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Background: Exclusive breastfeeding for the first 6 months is vital for child health, but many mother-infant pairs struggle due to challenges like sore nipples, engorgement, mastitis, latching issues, and low milk supply.

Methods: This cross-sectional study with longitudinal follow-up, conducted from December 2024 to June 2025 in selected health facilities, involved 383 first-time mothers. Data was gathered through interviews within 24 hours of birth and follow-ups by phone at weeks 1, 4, and 6, using structured questionnaires. Frequencies described the categorical data, and logistic regression for correlated data identified factors associated with breastfeeding challenges.

Results: Of the 383 mothers, 174 (45%) experienced early breastfeeding challenges, mostly within the first week, with perceived low milk supply being most common. Mothers with no or primary education and secondary education had lower odds (AOR 0.41; 95% CI 0.28 – 0.60 and AOR 0.37; 95% CI 0.25 – 0.54, respectively) of challenges compared to those with a college education. Single/divorced women also had lower odds (AOR 0.68; 95%CI 0.47 – 0.98). Those with low breastfeeding self-efficacy (AOR 4.74; 95% CI 2.62 – 8.59) and who lacked verbal advice on demand feeding (AOR 1.48; 95% CI 1.08 – 2.04) faced higher odds of challenges. Among those with challenges, 18% did not exclusively breastfeed versus 1% without challenges.

Conclusion: Nearly half of the first-time mothers face early breastfeeding challenges, mainly within 24 hours, with low milk supply being most reported. Married women, those with higher education, low self-efficacy, and lacking verbal advice on breastfeeding on demand had a higher likelihood of reporting breastfeeding challenges. Breastfeeding counselling during antenatal and postnatal care could reduce challenges, especially for women with low self-efficacy. Further research, including qualitative studies, is needed to explore perceptions related to low milk supply.

KEYWORDS: breastfeeding challenges; low milk supply; first-time mothers; antenatal care; postnatal care

OR-MCH-10

Post-Intervention Mixed Methods Assessment of Vitamin A Supplementation Program in Mara Region, Tanzania: Coverage, Service Uptake, Caregiver Knowledge and System Challenges

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Background: Vitamin A Deficiency has major consequences, including blindness, risk of infection and death. Over the past decade, Sub-Saharan Africa, including Tanzania, made tremendous efforts in improving maternal and child health through a strengthened healthcare system. In collaboration with the Tanzania Ministry of Health, Helen Keller started to support Vitamin A Supplementation (VAS) program implementation in the Mara region in February 2023, following a prior survey report showing coverage of <50%.

Objectives: The objective was to assess the current situation of VAS coverage among children aged 6-59 months, service uptake, caregiver knowledge, and health system challenges in Mara Region, Tanzania.

Methodology: This cross-sectional study included a representative household coverage survey, a health care workers (HCW) survey, and a community health workers (CHWs) survey, along with qualitative data collection through focus group discussions and in-depth interviews with caregivers, HCWs and CHWs.

Results: A total of 4,383 caretakers, 5,817 children aged 6-59 months, 267 CHWs, and 141 HCWs were analysed. Overall, VAS coverage during the June 2025 campaign was 77.6% (95%CI: 74.8 - 79.1%). This was highest in Musoma DC: 83.8% (81.0-86.3), followed by Bunda DC: 79.6% (75.6-83.0) and Butiama DC: 78.3% (72.9-82.9), while Musoma MC had the lowest coverage: 66.6% (62.5-70.4). The results also indicated an inverse relationship between VAS coverage and child age across councils, ranging from 83.7% in children aged 6 -11 months to 72.1% in those aged 36-59 months. Meanwhile, the highest coverage was observed among 95 children aged 6 months, where 84.3% (74.5-90.8%) of them received VAS.

Conclusion: Community-based delivery through CHWs and Caregiver knowledge improved coverage and uptake. VAS and RCH services faced access and awareness challenges in some areas, these can be mitigated through Integrated services, staff training, adequate supplies, reliable financing and supply chains, collaboration between government, CHWs, and communities.

KEYWORDS: Health system; RCH services; vaccination

OR-MCH-11

Pattern and Outcome of Electrolyte Disturbance (Sodium, Potassium) in Children Less than 15 Years of Age Admitted to Paediatric Intensive Care Unit in St.Paul's Hospital Millennium Medical College

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Background: Electrolyte disturbances are common among critically ill children and are associated with increased morbidity and mortality. Sodium and potassium imbalances may complicate the clinical course and often remain

unrecognized without routine monitoring, particularly in resource-limited settings.

Objective: To assess the pattern and clinical outcomes of sodium and potassium disturbances among children under 15 years of age admitted to the Pediatric Intensive Care Unit (PICU) at St. Paul's Hospital Millennium Medical College (SPHMMC), Addis Ababa, Ethiopia.

Methods: A retrospective cross-sectional study was conducted among pediatric patients admitted to the PICU from September 16, 2024, to September 15, 2025. Data were extracted from medical records using a structured tool. Descriptive statistics were used to summarize variables, and chi-square tests were applied to assess associations between electrolyte abnormalities and outcomes. Statistical significance was set at $p < 0.05$.

Results: A total of 177 patients were included, of whom 126 (71.1%) had electrolyte disturbances. Hyponatremia was the most common abnormality (32.2%), followed by hypernatremia (22.6%), hypokalemia (18.6%), and hyperkalemia (18.0%). Infants under one year were the most affected group. Hyponatremia was most frequently associated with central nervous system disorders (32.7%), while hypernatremia and hypokalemia were commonly linked to gastrointestinal conditions. Hyperkalemia was predominantly observed in patients with renal involvement (46.8%). Mortality was higher among patients with electrolyte abnormalities. Hypernatremia showed a statistically significant association with poor outcome ($p = 0.03$), whereas hyponatremia, hypokalemia, and hyperkalemia were not significantly associated with mortality.

Conclusion: Electrolyte disturbances are highly prevalent among critically ill pediatric patients and are associated with adverse outcomes, particularly in hypernatremia. Routine monitoring and timely correction of electrolyte imbalances are essential to improve outcomes in PICU settings. **Keywords:** Electrolyte disturbances, hyponatremia, hypernatremia, hypokalemia, hyperkalemia, pediatric intensive care, Ethiopia

KEYWORDS: Public health; Electrolyte disturbances; Pediatric intensive care; Clinical outcomes; Ethiopia

OR-MCH-12

"Prevalence and Factors associated with early neonatal complications among delivered women in Njombe region, Tanzania, 2024"

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Abstract.

Introduction: Neonatal complications are a critical global health issue, especially in low- and middle-income countries. In 2022, about 2.4 million newborns died, with nearly half of under-five deaths occurring in the early neonatal period. Sub-Saharan Africa carries the highest burden, accounting for 57% of under-five deaths and a neonatal mortality rate of 27 deaths per 1,000 livebirths. In Tanzania, reported neonatal deaths ranging from 26 to 40 deaths per 1,000 live births resulting from different early neonatal complications. This study determined the prevalence and factors associated with early neonatal complications among women delivering in health facilities in Njombe Region.

Methodology: We conducted a facility-based cross-sectional study using secondary data from mother-neonate pairs delivered in selected health facilities. Associations between maternal and obstetric factors and early neonatal complications were assessed using bivariate and multivariable Modified Poisson regression, reporting crude and adjusted prevalence ratios (cPR and aPR) with 95% confidence intervals.

Results: The study included 567 neonates from different facilities within the region. The prevalence of early neonatal complications was 40.7%, 95% CI: (0.37- 0.45). The most common early neonatal complications were birth asphyxia (31.7%), early onset neonatal sepsis (28.7%), respiratory distress (22.8%). Elective caesarean section was protective compared with emergency caesarean and statistically significant (aPR=0.62; 95% CI: 0.58-0.65; p-value; 0.002). Maternal complications during pregnancy or delivery significantly increased risk of early neonatal complications (aPR=1.4; 95% CI: 1.19-1.64; p-value; 0.001)

Conclusion: The findings revealed, higher prevalence of early neonatal complications driven by several factors such as maternal complications and emergency caesarean sections. Birth asphyxia, respiratory distress and early onset neonatal sepsis were the common complications. To improve neonatal well-being, strengthening intrapartum monitoring and timely planned obstetric interventions are necessary measures to be considered among healthcare workers. **Keywords:** Prevalence, early neonatal complications and prevalence.

KEYWORDS: early neonatal; complications; prevalence

OR-MCH-13

Estimation of Disability Adjusted Life Years to pediatric injury patients at a Zonal referral hospital in Northern Tanzania

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Background: Disability-adjusted life years (DALYs) quantify overall disease burden by combining premature mortality and disability. However, disability weights for pediatric trauma are often poorly defined. This study estimates DALYs among pediatric injury patients at a zonal referral hospital in Northern Tanzania from November 2020 to June 2024.

Methodology: This is a retrospective cohort study using pediatric injury registry data, included patients <18 years presenting to the Emergency Medicine Department with injuries occurring within the previous month who survived to evaluation. Outcomes included in-hospital mortality and morbidity. Data were analyzed using STATA version 17. DALYs were calculated as the sum of years of life lost (YLL) and years lived with disability (YLD), based on the final diagnosis with the highest disability weight. Sensitivity analysis incorporated a 3% discount rate, age-weighting parameter (β) of 0.04, and constant (C) of 0.1658.

Results: A total of 1,000 pediatric injury patients were involved in this study, with a median age of 7 years. A total of 65 (6.6%) pediatric patients died, with burns responsible for 27 (41.6%) of all deaths. The pediatric injuries led to a loss of over 4,500 years of healthy life in the population studied, with male patients contributing a higher DALY burden of 2,855 years. However, neurosurgery contributed the highest burden, accounting for approximately 1,590 years lost. The DALYs were highest, at 1,659 years, among patients aged 6 to 11 years compared to other age groups.

Conclusion: This study underscores the substantial burden of pediatric injuries, male children were disproportionately impacted, resulting in a higher contribution to the overall DALYs. These findings highlight the significant contribution of neurosurgical and general surgical cases to the overall burden of injury-related disabilities in pediatric patients, underscoring the need for targeted interventions in these areas.

KEYWORDS: DALY's; pediatric; patients; injury; KCMC; Zonal; referral; hospital.

OR-MCH-14

Feasibility and Impact of the VAYU Continuous Positive Airway Pressure (CPAP) Across a Network of Care in Dar es Salaam

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Introduction: Neonatal mortality remains a major public health challenge in Tanzania, particularly among preterm and low-birth-weight infants who are at high risk of respiratory distress. The Breathing for Babies (BfB) ecosystem project was established to evaluate the feasibility and impact of the VAYU CPAP device, a low-cost, portable, non-invasive respiratory support system designed for resource-limited settings. The project adopts a comprehensive approach to neonatal care by strengthening maternal linkages to health facilities, improving inpatient neonatal care, and supporting safe transport through a hub-and-spoke network in Dar es Salaam.

Methodology: A mixed-method observational cohort study was conducted across three districts: Kinondoni, Ilala, and Temeke. The study followed four key phases: exploration, preparation, implementation, and sustainability. Exploration assessed existing gaps, while preparation focused on training healthcare workers and establishing logistics. Implementation involved deploying the VAYU CPAP device and collecting real-time data, and sustainability assessed long-term integration within the health system. Data were collected using the REDCap platform, supported by structured checklists to ensure quality and consistency.

Results: Between August 2025 and January 2026, 8,282 deliveries were recorded, and 9,665 infants were screened. A total of 435 neonates (4.5%) received VAYU CPAP. Data completeness was high, with 94.3% for delivery observations and 97.7% at 6-hour follow-up, though it declined to 65.3% at 72 hours. At 72 hours, 74.4% of neonates were alive, while 7.5% died and 7.1% required referral.

Conclusion: The BfB project demonstrates that the VAYU CPAP device can significantly improve neonatal survival in resource-limited settings. Its scalability and affordability make it a promising intervention for strengthening neonatal care and reducing mortality in Tanzania and similar contexts.

KEYWORDS: VAYU CPAP; Newborn; Resources limited setting.

OR-MCH-15

Factors associated with screen time use among preschool children in Dar es Salaam, Tanzania

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Background: Excessive screen time in early childhood has been associated with poor sleep, overweight, and developmental delays. The World Health Organization recommends no screen exposure for children under 2 years and a maximum of 1 hour per day for those aged 2–5. Unfortunately, many children exceed these limits. In Tanzania, no national or professional guidelines exist on screen use in children. Understanding adherence to WHO recommendations and identifying factors contributing to excessive screen exposure is essential for developing targeted interventions to promote healthy behaviours.

Methods: We conducted an analytical cross-sectional study among 499 children aged 2–5 years and their caregivers from preschools in Ilala District, Dar es Salaam. Data were collected using structured caregiver questionnaires administered both online and in paper form. Descriptive statistics were used to summarize screen time exposure, and logistic regression identified factors associated with adherence to WHO guidelines (≤ 1 hour/day). The primary outcome was the proportion of children meeting WHO screen time recommendations.

Results: Only 8.6% of children adhered to WHO guidelines, with a mean daily screen time of four hours. In unadjusted analyses, excessive screen time was associated with the presence of a television at home (COR 2.85; 95% CI 1.48–5.50; $p = 0.001$), caregiver perception that screens disrupt sleep (COR 0.49; 95% CI 0.24–0.97; $p = 0.041$), and being cared for primarily by biological mothers (COR 0.20; 95% CI 0.05–0.86; $p = 0.017$). None of these associations remained statistically significant after adjustment for potential confounders.

Conclusion: The majority (91.4%) of preschool children in our study exceeded WHO screen time guidelines. While device availability and caregiver-related factors appear influential, adjusted analyses did not confirm independent associations. These findings highlight the need for national guidelines, caregiver education, and school-based programs to promote healthier screen use and reduce the risks of excessive screen exposure in early childhood.

KEYWORDS: Screentime; Preschool children; Early childhood; Tanzania

OR-MCH-16

Risk Factors for Anaemia in Infants Under Six Months: Evidence from a Global Scoping Review

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Background: Anaemia in infants under six months is often overlooked, with the assumption that they accumulate sufficient iron stores during pregnancy. Consequently, most research and public health interventions focus on children aged six months and above, leaving a critical evidence gap for younger infants. This study aimed to identify and synthesize the existing evidence on risk factors for anaemia among infants under six months old.

Methods: We conducted a global scoping review using PRISMA-ScR reporting, retrieving records from Scopus, Web of Science, MEDLINE, CAB, Academic Search Ultimate, CINAHL, Africa-Wide, and ProQuest Dissertations databases between 4th February and 20th February 2025. Thirty-two articles were included in the final analysis. Data were analyzed and organized thematically, with risk factors categorized into maternal and child-related domains.

Results: Maternal risk factors commonly reported across multiple studies included anaemia during pregnancy (7), teenage pregnancy (2), low socio-economic status (2) and delivery history (2). Frequently reported child-related factors included newborn status at birth, particularly low birthweight (6) and prematurity (2); male infants (4); feeding practices (3); and illness history (2). Maternal anaemia during pregnancy was the most consistently reported risk factor.

Conclusion: A combination of maternal and child-related factors drives anaemia in infants under six months. Maternal anaemia during pregnancy emerges as the most consistent determinant. Addressing maternal nutrition is a critical first step in breaking the intergenerational cycle of anaemia. But prevention strategies should adopt a continuum-of-care approach, integrating pregnancy and postdelivery services, alongside strengthening antenatal and postnatal nutrition services—including early screening and treatment for anaemia—and targeting high-risk infants. These approaches need to be integrated into national maternal and child health packages in Tanzania and other low- and middle-income countries to support universal health coverage by improving equitable access to preventive and curative services.

KEYWORDS: Anaemia; infants under six months; risk factors; scoping review

OR-MCH-17

Transitioning Youth to Adult HIV Care in Dar es Salaam, Tanzania: A Phenomenological Study of Systematic Gaps, Barriers and Stakeholders Experiences

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Introduction: The transition of youth living with HIV (YLHIV) from pediatric to adult care is often unstructured, increasing the risk of treatment disengagement and poor clinical outcomes. Despite its importance, there is limited evidence of how the transition process is experienced and managed in routine care settings. **Aim:** This study explored the experiences, barriers, and facilitators perceived by healthcare workers, health managers, and parents/caregivers in supporting successful transition of YLHIV to adult care

Methods: This is a phenomenological qualitative study that explored perspectives of health managers, healthcare providers, and parents/caregivers, on clinic-based norms and practices during the transition period to adult care using narrative data from 7 focus group discussion (FGDs) and analyzed using a hybrid coding approach in DEDOOSE, with codes/themes initially guided by the FGD framework and adjusted for emergent concepts.

Results: Participants presented challenges, including inadequate healthcare provider training, limited transition guidelines, and insufficient parental involvement. Although preparatory interventions such as HIV status disclosure, mental health support, sexual and reproductive health education, vocational training, peer support and HIV education were reported their implementations were inconsistent. Additional barriers were HIV-related stigma and forced transitions to adult care. Readiness was often assessed by age, not maturity or self-management capacity, resulting in abrupt transitioning. Recommendations included employing a multidisciplinary approach to improve health outcomes.

Conclusion: The transition of YLHIV is shaped by provider capacity and the availability of structured support systems. Key elements of successful transition include effective HIV disclosure, psychosocial support, readiness assessment beyond age, and active parental involvement. Strengthening transition guidelines, provider training, and integrated mental health and SRH services is critical to improving health outcomes for YLHIV in Tanzania and similar resource limited settings

KEYWORDS: Adolescent; Youth; HIV services; Transition; healthcare workers; parents; barriers; facilitators; mental health; peer support.

OR-MCH-18

Assessment of knowledge, attitude and practice of preconception care among HIV positive pregnant women attending Bugando Medical Centre, Mwanza

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Background: Despite the critical role preconception care plays in ensuring maternal and fetal health, it remains under utilized in low and middle income countries like Tanzania. Preconception care is especially important for HIV positive women to optimize maternal health, reduce mother to child transmission and improve pregnancy outcomes. Therefore, this study aimed at determining the knowledge, attitude and practice (KAP) of Human Immunodeficiency Virus (HIV) positive pregnant women at a zonal referral hospital.

Methodology: A cross-sectional descriptive study conducted among 384 HIV positive pregnant women sampled conveniently at Bugando Medical Centre from September to November 2024. Data was collected using a structured questionnaire and entered in Microsoft excel. Both descriptive and inferential statistics were conducted

using STATA version 15. Descriptive statistics was presented in figures and tables, as frequencies, percentages, mean and standard deviation. At a 95% confidence interval, relationship between variables was determined using chi square test.

Results: A total 384 HIV positive pregnant women whose mean age was 30.6 ± 6.7 years. The median duration since HIV diagnosis was 5 [IQR: 3-8] years. Two hundred and seventy five (71.6%) had heard of preconception care, majorly from healthcare providers. More than half, had good knowledge (52.1%) and positive attitude (56.8%) but only a third had good practice (36.7%) of preconception care. Both good knowledge and positive attitude were statistically associated with participants of age 25-34, ≥ 35 years, secondary and tertiary education at higher odds. Tertiary educated (AOR: 3.47) women were more likely to have good practice and prim gravida women (AOR: 0.16) were less likely to have good practice of preconception care.

Conclusion: HIV positive pregnant women in this setting had a good knowledge, positive attitude but relatively poor practice of preconception care. More emphasis and education be provided to community using channel sources like healthcare providers, media and internet.

KEYWORDS: Preconception Care (PCC); HIV Positive Pregnant Women; Maternal and Child Healthy; Antiretroviral Therapy (ART)

OR-MCH-19

The Impact of Masculinity on Parenting and Implications for Early Childhood Development in Tanzania

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AFFILIATIONS

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Background: Father involvement is critical for early childhood development (ECD). However, hegemonic masculinity often limits fathers' participation in the parenting of their children.

Objective: To explore how fathers negotiate provider and caregiver roles in the peri-urban Tanzanian context.

Methods: A total of 117 fathers of children aged 0-3 years participated in 11 focus group discussions (FGDs) and 10 in-depth interviews (IDIs). We explored male caregivers' roles in parenting children in their early years. FGDs and IDIs were conducted in Kiswahili, recorded and transcribed verbatim, and later translated into English, and analysed thematically using the ECD and hegemonic masculinity frameworks.

Results: The findings reveal several interconnected themes shaping fathers' involvement in caregiving. Fathers demonstrate a hybrid fatherhood identity, balancing traditional provider roles with increasing engagement in emotional caregiving. Knowledge about caregiving is mainly acquired informally, through observation and trial and error, which highlights limited access to structured early childhood development support. The roles of fathers reflect a dynamic interplay between presence and provision, with active involvement and responsiveness seen as essential complements to financial contributions. A gendered division of caregiving persists, as women often take on intimate caregiving tasks, while men tend to engage more in teaching, supervision, and play. Within household dynamics, fathers maintain authority in decision-making and discipline, often merging patriarchal roles with a focus on moderated punishment. Their involvement is further affected by structural and social constraints, including economic pressures, time limitations, and societal expectations. Despite these challenges, fathers are strongly motivated by future-oriented aspirations centred on their children's success, well-being, and confidence.

Conclusion: Fathers negotiate hegemonic masculinity and emerging nurturing roles, influencing child development outcomes. Effective ECD interventions must be gender-sensitive, context-aware, and address both economic and social barriers to male engagement.

KEYWORDS: Masculinity; Parenting; Early Childhood Development; Tanzania

Characteristics Associated with Norms and Attitudes on Age-Disparate Transactional Sex among Adolescents and Adults in Mwanza and Geita Regions, Tanzania

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AFFILIATIONS

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Background: Age-disparate transactional sex (ADTS) is a public health concern in Tanzania, influenced by social norms and attitudes. Understanding the socio-demographic and other factors associated with negative norms towards ADTS is critical for design and targeting of effective interventions.

Methods: We conducted a cross-sectional survey among adolescent (age < 18) and adult (age 18+) populations in the districts of Illemela and Misungwi (Mwanza region) and Geita (Geita region), Tanzania. In each district, we sampled 10 wards, 30 in total across the three districts. We used linear regression to explore the association between respondent characteristics and scores on the Norms and Attitudes on Age-Disparate Transactional Sex Scale (NAATSS), where higher scores indicate less gender-equitable norms that age were included as a covariate.

Results: Of the 1,199 participants, 314 were women, 285 were adolescent girls, 304 were men, and 296 were adolescent boys. Mean NAATSS scores were higher among adults (37.02 for women, 36.01 for men) than adolescents (32.27 for girls, and 34.01 for boys, with overall scores ranging from a minimum mean of 13 to a maximum mean of 52. Among women lower education levels were associated with higher NAATSS scores, an average of 2.69 point higher (95% CI: 0.007 – 5.37) among those with no education compared to those with secondary education or above. This pattern was mirrored among adolescents: in-school boys and girls had significantly lower NAATSS scores (Boys $b = -3.67$, 95% CI: -5.51 to -1.83; Girls $b = -2.35$, 95% CI: -4.4 to -0.3, respectively) than their out-of-school peers.

Conclusion: The results underscore a clear socio-demographic profile associated with negative norms towards ADTS. Public health strategies aimed at addressing ADTS should prioritize engaging out-of-school youth and less-educated adults, with interventions tailored to specific geographic and gendered contexts like radio drama listening.

KEYWORDS: Public health; Tanzania

Women's Perspectives on the Acceptability of Family Planning Self-Care: Insights from Reproductive-Age Women in Tanzania

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Introduction: Family planning uptake in Tanzania remains low, with only 64% of demand among married women met, and rural areas facing greater challenges due to uneven healthcare distribution. Expanding access through community outreach, mobile services, pharmacies, and Accredited Drug Dispensing Outlets (ADDOs) is essential. Self-care interventions such as self-awareness, self-testing and self-management offer promising ways to improve access. Aim: To explore women's perspectives and acceptability of family planning self-care

Methodology: A cross-sectional qualitative study explored perceptions and acceptability of family planning self-care among users in Dar es Salaam, Mwanza, and Tanga using FGDs. Thematic data analysis was done.

Results: Focus group discussions revealed that participants understood contraceptive self-care, citing condoms, pills, and calendar tracking as common methods. However, misconceptions, such as drinking water after intercourse, were also reported. Attitudes toward self-care were generally positive, especially among youth who valued condoms for dual protection against pregnancy and sexually transmitted infections. Barriers included economic hardship, distance to facilities, stock-outs, stigma, and male partner opposition. Women's autonomy in decision-making was often limited by cultural and social pressures, though choices were frequently negotiated within couples. Health workers and hospitals were the most trusted sources of information, while pharmacies were appreciated for accessibility. Recommendations emphasize strengthening community education to dispel misconceptions, particularly among adolescents and underserved rural populations. Health workers should expand outreach, and pharmacies should be integrated as reliable information points. Male involvement is crucial to reduce opposition and foster supportive family planning decisions. Improving distribution of contraceptive commodities in rural areas and leveraging radio, television, and social media can further enhance access and awareness.

Conclusion: Contraceptive self-care is positively perceived and widely practiced, but misinformation, access barriers, and social pressures hinder its effectiveness. Trust in health workers provides a strong foundation for scaling interventions, while education and improved distribution remain urgent priorities.

KEYWORDS: Contraceptive; Self-care

OR-MCH-22

Invisibility of Adolescent Boys' Sexual Violence Vulnerability and Implications for Prevention and Perpetration Research in Tanzania

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Background: Sexual violence against children and adolescents remains a critical public health and human rights concern. In Tanzania, an estimated 11% of girls and 5% of boys report experiencing sexual violence before the age of 18; however, prevention and response efforts have largely overlooked how adolescent boys perceive and experience sexual violence risks. This gap limits effective prevention of both victimisation and perpetration of sexual violence among boys.

Objective: To examine adolescent boys' perceptions of sexual vulnerability and the implications for sexual violence prevention in Tanzania.

Methods: We conducted in-depth interviews with 10 adolescents (5 girls and 5 boys, aged 11–20 years) and 20 caregivers (10 women and 10 men, aged 21–60 years) participating in the ParentApp for Teens randomised controlled trial. Analysis explored perceptions of sexual violence risk, vulnerability, disclosure, and parent-child communication.

Results: Boys perceived sexual violence as rare and not personally relevant. Boys' vulnerability was narrowly defined, recognised only in exceptional circumstances, and shaped by masculinity norms equating strength with invulnerability and discouraging disclosure. Consequently, boys' experiences of coercion, abuse of power, and sexual harm were largely rendered invisible to themselves, caregivers, and prevention messaging. Across genders, sexual violence was primarily defined as rape, with limited recognition of coercion or consent violations.

Conclusion: This study addresses a critical gap in sexual violence research by centring adolescent boys' vulnerability, an area largely absent from popular prevention approaches. Findings demonstrate that boys are not protected by invulnerability but by invisibility, undermining both prevention and early response. Sexual violence prevention must embrace gender-responsive, adolescent-centred approaches that legitimise boys' vulnerability, strengthen disclosure pathways, and explicitly engage boys in perpetration prevention.

KEYWORDS: Boys; Sexual Violence; Vulnerability; Prevention; Perpetration

Beyond Empowerment: Young Women's Lived Realities After Cash Transfer Programme in Kahama, Tanzania

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Background: Cash transfer programmes are advocated as effective interventions to enhance the socio-economic well-being of vulnerable populations and ultimately reduce HIV rates, especially among adolescent girls and young women. However, the evidence regarding their long-term effects remains inconclusive. This paper explores the lived experiences of young women in Kahama, Tanzania, two years after participating in a cash transfer programme, focusing on their living arrangements, livelihood strategies, and perceived standards of living.

Methodology: We conducted a participatory ethnographic study using a peer-researcher approach to accurately capture lived experiences. Based on 18 narrative interviews, the study applies the concept of epistemic injustice, especially testimonial injustice, to analyse how young women's knowledge is often marginalised in programme design and evaluation.

Results: Findings show that while cash transfers provided short-term financial relief and helped some participants start small income-generating activities, they rarely led to lasting economic change. Structural barriers such as poverty, gender norms, and limited access to stable employment continued to shape participants' lives. Living arrangements before, during, and after the programme often remained consistent, with most young women staying in extended family systems or households dependent on males. The programme tended to reinforce dependency rather than reduce it, positioning young women as financial contributors while still relying on their families. After the programme, livelihoods were characterised by fragile informal businesses that frequently failed under financial pressure. Many participants struggled to survive household needs, with earnings absorbed by daily expenses, thus restricting opportunities for economic growth. This economic insecurity sometimes drove debt and risky coping strategies.

Conclusion: This study questions the assumption that cash transfers are inherently empowering, highlighting their temporal and inconsistent effects. It underscores the need to consider beneficiaries' experiences in programme design and promotes long-term strategies to address structural inequalities, recognising young women as informed agents in their lives.

KEYWORDS: Cash transfers; Empowerment; Young Women; Livelihoods; Tanzania

Governing Menstrual Health and Hygiene: Analyzing the Policy-Implementation Gap for Schoolgirls in Tanzania

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AFFILIATIONS

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Background: Menstrual Health and Hygiene (MHH) is increasingly recognized as essential for educational equity, yet translating high-level advocacy into systemic grassroots change remains difficult. While national discourse on MHH in Tanzania is advancing, little is known about how political commitment and policy translate into local implementation. This study explored governance dimensions of MHH, highlighting barriers and opportunities for scaling school-based interventions.

Methods: A descriptive qualitative cross-sectional study was conducted in 2019 covering 16 administrative regions of Mainland Tanzania and Zanzibar. Data were collected through Focus Group Discussions and Key Informant Interviews. Thematic content analysis was applied using a deductive approach, supported by verbatim quotations.

Results: There was sharp contrast in MHH prioritization between national and local levels. Nationally, political will was evident through VAT exemption, integration of MHH into School Water Sanitation and Hygiene (S-WASH) and WASH in healthcare guidelines, and curriculum revisions. However, at district and school levels, practitioners were often unaware of these policies. Local leadership was rarely sensitized, sustaining a “culture of silence” and resulting in no dedicated budgets. Consequently, head teachers carried the fiscal burden of MHH services within already strained school budgets. Grassroots initiatives—such as NGO-led WASH clubs and “Trainer of Trainers” programs—were effective but fragmented, lacking structural support for national scalability.

Conclusion: MHH governance was characterized by a developing but fragmented national policy discourse without a standalone strategic framework. Bridging the implementation gap requires institutionalizing MHH within core strategic documents of health and education sectors, rather than as secondary components of broader guidelines. Strengthening inter-ministerial coordination and establishing district-level funding mechanisms are critical to move from localized interventions toward sustainable, government-led national programs that uphold every girl’s right to health and education.

KEYWORDS: Menstrual Health and Hygiene; Governance; Education Policy; School WASH; Tanzania; Policy Implementation Gap

PO-MCH-04

Engagement in Transactional Sex and IPV Perpetration among Men in Mwanza, Tanzania: Findings from the LINEA Trial Baseline Survey

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Background: Transactional sex (TS) and intimate partner violence (IPV) against women and girls are important drivers of HIV risk in Sub-Saharan Africa. While women’s experience of IPV has been linked to engagement in TS, less is known about the relationship between TS and IPV perpetration among men, particularly in the context of age-disparate TS between adolescent girls and older men.

Methods: We conducted a cross-sectional survey among men (23-50 years) working as motorcycle taxi-drivers. We used logistic regression to estimate age-adjusted odds ratios (aOR) between reported lifetime engagement in TS (never; ever engaged in TS and last TS relationship was with a woman ≥ 18 years; ever engaged in TS and last TS relationship was with a girl < 18 years) and past-year perpetration of IPV (outcomes included physical; sexual; physical and/or sexual IPV against any partner).

Results: Of 456 men, 15% reported past-year sexual IPV perpetration, 16% physical IPV, and 26% physical and/or sexual IPV. Overall, 33% reported ever engaging in TS with women ≥ 18 years; 7% with girls < 18 years. Compared to those who reported never engaging in TS, men who engaged in TS with a woman aged ≥ 18 years were more likely to report past-year physical and/or sexual IPV perpetration against any partner (33% versus 18%, aOR=2.2, 95%CI:1.3–3.7), with a substantially stronger association among men reporting TS with a girl < 18 years (59% versus 18%, aOR=6.1, 95%CI:2.7–13.9). The same trend was observed for physical and sexual IPV outcomes.

Conclusion: Men’s engagement in TS — particularly age-disparate TS involving adolescent girls — is strongly associated with IPV perpetration. Violence prevention efforts must address the co-occurrence of these harmful behaviours, by prioritising gender transformative programming aimed at shifting masculinities that normalise men’s control over women, and men’s engagement in sexual conquests of adolescent girls.

KEYWORDS: Public health; Tanzania

Retention of HIV exposed infants in care and Its influencing factors in Mbeya and Songwe regions. A retrospective study

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Background: The retention of HIV-exposed infants in care programs is critical for preventing mother-to-child transmission and ensuring timely diagnosis and early initiation of treatment among the HIV exposed infants. This retrospective study examined the retention of HIV-exposed infants and the influencing factors.

Methodology: The retrospective study involved data extracted from the study database and Mothers locator's forms collected from mothers enrolled in the LIFE study from 2019 to 2022 in 14 health facilities in Mbeya and Songwe regions. Key variables included maternal HIV status, maternal HIV disclosure status, maternal age, maternal education, maternal timing of HIV diagnosis, distance to healthcare facilities and socio-economic factors.

Results: The study results show 84.9% of the infants were retained in PMTCT care at 18 months follow up. The odds of being retained in PMTCT were higher in older compared to younger mothers. Also, odds of retention of HIV exposed infants were high in mothers with secondary education or higher compared to the mothers with primary education.

Conclusion: Findings from this study show that a large proportion of HIV exposed infants were retained in PMTCT care at month 18 follow up in Mbeya and Songwe regions. The retention of HIV exposed infants is influenced by multidimensional factors such as maternal sociodemographic factors and health facilities accessibility factors. Efforts should focus on strengthening health services based on maternal needs and follow-up mechanisms at the health facility level to ensure timely diagnosis of HIV and enhance the engagement of HIV-exposed infants in care throughout the PMTCT continuum.

KEYWORDS: Public health; epidemiology; HIV exposed infants(HEIs); Retention in care; prevention of Mother to child transmission (PMTCT) Early infant diagnosis (EID); Antiretroviral therapy (ART); Loss to follow-up (LTFU)

Effects of psychosocial factors on late first antenatal care visit in selected health care facilities: A case of Mbeya City Council

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Background: Antenatal care (ANC) is essential for early detection and management of pregnancy-related complications, yet many women in low- and middle-income countries, including Tanzania, delay their first visit, contributing to poor maternal and neonatal outcomes. Evidence on the role of psychosocial factors in this delay remains limited.

Objective: To assess the influence of psychosocial factors on late first ANC visit among pregnant women in Mbeya City Council, Tanzania.

Methods: A cross-sectional study was conducted among 353 pregnant women aged 15–49 years attending their first ANC visit. Data on socio-demographics, social support, stigma, mental health (anxiety and depression), and timing of ANC initiation were collected using structured questionnaires from seven selected health facilities in Mbeya City council. Descriptive and inferential analyses were performed using Stata, and multivariable modified Poisson regression was used to determine associations.

Results: The prevalence of late ANC initiation was 77.1%. Women with perceived social support were less likely to initiate ANC late (aPR = 0.80; 95% CI: 0.79–0.81). Perceived stigma (aPR = 1.16; 95% CI: 1.12–1.21), depression (aPR = 1.22; 95% CI: 1.06–1.41), and anxiety (aPR = 1.27; 95% CI: 1.20–1.35) were significantly associated with higher likelihood of late ANC initiation.

Conclusion: Late ANC initiation remains high and is strongly influenced by psychosocial factors. Integrating psychosocial support, including routine screening for anxiety and depression and clear referral pathways, is recommended to improve timely ANC attendance.

KEYWORDS: Psychosocial; Antenatal care; Mbeya city council

PO-MCH-01

Double Burden of Malnutrition among Adolescents 10-19 Years in Tanga Region, Tanzania: A Cross-Sectional Study

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Background: The coexistence of undernutrition and overnutrition, known as the double burden of malnutrition (DBM), is a public health challenge among adolescents aged 10-19 years in low- and middle-income countries. Adolescence is a critical period for growth and nutritional interventions; however, evidence on DBM among Tanzanian adolescents remains limited, and this group is often overlooked in nutrition policies and programs. This study assessed the coverage and correlates of DBM among adolescents in Tanga region, Tanzania.

Methods: We conducted a secondary analysis of two repeated cross-sectional surveys conducted in 2022 and 2023, including 2,511 adolescents aged 10-19 years (1,262 in Survey 1 and 1,249 in Survey 2). DBM was calculated using WHO indicators: body mass index, height-for-age and sex z-scores, and anemia. DBM was defined as the coexistence of two or more forms of malnutrition (underweight, overweight, stunting, and anemia). The Chi-squared test was used to compare DBM proportions across respondent characteristics, while multivariable logistic regression analysis determined the correlates at a two-sided threshold of <0.05 using Stata version 18.0.

Results: The mean age of participants was 13.6 (SD 2.8) years, and 59.6% were males. DBM decreased from 14.7% in 2022 to 9.8% in 2023. Stunting, anemia, and overweight declined from 17.6% to 16.4%, 38.8% to 23.5%, and 10.7% to 8.7%, respectively, while underweight increased from 6.3% to 8.8%. In the multivariable logistic regression, female adolescents had lower odds of DBM (OR 0.76, 95% CI: 0.59–0.99), as did participants in Survey 2 (OR 0.60, 95% CI: 0.46–0.79). Non-significant protective trends were observed among older adolescents, those with secondary education, and out-of-school adolescents.

Conclusion: DBM remains common among adolescents in Tanga Region, particularly among males, younger adolescents, and those in school. Integrated, school-based interventions addressing both undernutrition and emerging overnutrition are needed to improve adolescent health outcomes in Tanzania.

KEYWORDS: Double burden of malnutrition; Adolescents; Nutritional status; Tanzania.

Neglected Tropical Diseases

33 Abstract(s)

OR-NTD-01

Active Microfilarial Infection and Diabetes Prevalence in Lymphatic Filariasis Hotspots: Preliminary Descriptive Findings from Tanzania

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Background /

Introduction: Lymphatic filariasis (LF) induces immunoregulatory changes that may influence diabetes mellitus (DM) risk. However, human data from sub-Saharan Africa are limited. We preliminarily explored whether active microfilarial (MF) infection is associated with lower DM prevalence compared to FTS-positive/MF-negative or FTS-negative individuals in Tanzanian LF hotspot districts.

Methods: This cross-sectional study enrolled adults (≥ 20 years) from three LF hotspot districts (Lindi, Mtwara). Participants were classified as controls (FTS-negative, $n=209$), cases MF-negative (FTS-positive/MF-negative, $n=240$), and cases MF-positive (active infection, $n=11$). DM was defined as $HbA1c \geq 6.5\%$. No hypothesis testing was performed; only descriptive observations are reported pending completion of lipid, cytokine, and STH analyses.

Results: Among 460 participants, overall DM prevalence was 8.1% in controls, 12.1% in MF-negative cases, and 0% in MF-positive cases ($n=11$). FTS positivity alone (combining MF-negative and MF-positive) showed no clear protective effect against DM (11.6% vs. 8.1% in controls), suggesting that any potential metabolic protection may be specific to active MF infection. The small number of MF-positive individuals (2.4% of cases) reflects the success of mass drug administration in Tanzania.

Conclusion: Zero diabetes observed among 11 MF-positive participants is descriptively consistent with an immunoprotective hypothesis, but must be interpreted with great caution due to small sample size and pending laboratory data (cytokines, lipids, STH). We recommend: 1) treating this observation as hypothesis-generating only; 2) completing full biomarker assays to explore potential mechanisms (IL-10, Tregs, adipokines); and 3) considering multi-site collaboration to achieve an adequate sample size of MF-positive individuals for definitive analysis.

KEYWORDS: Lymphatic filariasis; diabetes mellitus; microfilariae; immunomodulation; HbA1c; neglected tropical diseases; metabolic protection; Tanzania; FTS; Wuchereria bancrofti

OR-NTD-02

Comparing the Effectiveness of Test and Treat Approaches with Doxycycline or Moxidectin and Albendazole versus Ivermectin and Albendazole for Targeted Elimination of Lymphatic Filariasis in Tanzania - a Phase III Clinical Trial

Winfrida John¹

AFFILIATIONS

Background: For over 20 years, mass drug administration (MDA) with ivermectin (IVM) and albendazole (ALB) has been used to eliminate lymphatic filariasis (LF). Although MDA has greatly reduced disease burden, transmission persists in a few former endemic hotspots. Current MDA drugs mainly target microfilariae. Drugs with macrofilaricidal activity, such as doxycycline (DOX) and moxidectin (Mox), may be more effective at eliminating adult worms. This study assessed, in a “test and treat” approach, whether DOX plus IVM/ALB or Mox/ALB is more effective than standard IVM/ALB among people still infected after repeated MDA.

Methods: This community-based clinical trial was conducted in Lindi, Mikindani, and Mtama, Tanzania. The study included six visits: pre-screening, screening, treatment, safety assessment, and two follow-ups. Participants aged 5–70 years were screened using the Filarial Test Strip (FTS). FTS-positive participants aged 14–70 years were treated according to the randomly assigned study area. FTS-positive males were also examined for filarial dance sign (FDS) by ultrasound. Participants in Mikindani received Mox 8 mg plus ALB 400 mg; Mtama received IVM 200 mcg/kg plus ALB 400 mg; and Lindi received DOX 100 mg daily for 5 weeks, followed by IVM 200 mcg/kg plus ALB 400 mg. Data were collected using case report forms and double-entered into REDCap.

Results: Among 5,222 participants screened, 347 (6.6%) were FTS-positive; 78.4% were male. Eleven participants were microfilariae-positive, and 18 were FDS-positive. Overall, 251 participants were treated: 88 in Mtama, 79 in Mikindani, and 84 in Lindi. Forty-four participants reported 64 adverse events; 20 reported more than one event.

Conclusion: Persistent transmission of LF in these areas has enabled the conduct of a community-based clinical trial whose results will help identify alternative treatments to prevent recrudescence in areas where MDA will be stopped. Final results will be presented upon completion of the study.

KEYWORDS: Lymphatic filariasis; Ivermectin; Albendazole; Filarial Test Strip; MDA

OR-NTD-03

Microbiome Analysis of Adenolymphangitis-Causing Bacteria in Filarial Lymphedema Patients: A Study in the Lindi Region.

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AFFILIATIONS

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Background: Patients with lymphedema suffer from episodes of adenolymphangitis (ADL) attacks.. The exact etiology of ADL attacks still remains unknown, although secondary bacterial infections that get access through cracks on the skin have been thought to trigger the attacks. We conducted a study to identify organisms associated with the inflammatory episode and testing antimicrobial sensitivity, with the aim of providing better treatment options in morbidity management.

Methods: A 3 years study included: Collection of baseline samples (before ADL attack), Collection of samples during an ADL attack, Collection of samples during a subsequent ADL attack. At baseline and during attacks, two sets of three swabs in eNAT and Amies medium were collected per participant, one each leg, one pooled from the belly button and the groin crease. Wound swabs might also be taken from the parts of each leg where there are skin cracks, secretion of tissue fluid and skin lesions. For the controls only baseline samples were taken. Up to 15ml venous blood was collected for NGS analysis and immunological analysis, 20ml for blood culture during ADL.

Results: Participant Enrolment was successfully completed; 201 participants were enrolled, 151 Lymphedema Cases and 50 Controls, among the 151 LE participants, 4 (2.6%) had chronic wounds from which additional targeted swabs were collected. Total blood aliquots processed and stored: 201 sets, Swab samples collected and processed: Over 1,200 primary swabs plus additional wound swabs. Amies swabs: Successfully cultured,

identified, and sensitivity-tested where growth occurred; all isolates stored at -80°C for future NGS and AMR analysis.

Conclusion: The baseline field phase of the TAKEOFF-Microbiome study has been executed successfully and in full accordance with the study protocol. Enrolment of 201 participants and collection of high-quality samples provide a strong foundation for NGS analysis, antimicrobial sensitivity testing, and improved understanding of ADL in filarial lymphedema.

KEYWORDS: LYPHATICFILARIASIS; LF

OR-NTD-04

Is Tanzania approaching the zero-by-2030 rabies elimination target? A retrospective analysis (2005-2025)

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Background: Rabies remains a fatal yet preventable zoonotic disease and continues to pose a significant public health burden in Tanzania. Despite ongoing control efforts, dog-mediated transmission persists, largely due to inadequate vaccination coverage and gaps in surveillance systems.

Methods: A retrospective study was conducted using secondary data on reported rabies cases, deaths, and vaccination coverage over a twenty-year period. Data were analysed to assess temporal trends, spatial distribution, and patterns of rabies occurrence in both human and animal populations.

Results: Rabies cases were reported across all regions, confirming endemicity. Dogs were the primary reservoir, with occasional spill over to livestock. Dog rabies cases exhibited cyclical patterns over time. Human rabies deaths declined markedly after 2015, with no deaths reported from 2018 onwards. Vaccination coverage remained below the recommended 70% threshold, averaging 28% between 2005 and 2018, but increased to 42.6% in recent years. Data gaps and inconsistencies in vaccination efforts were also identified.

Conclusion: Although reductions in human mortality indicate progress, rabies transmission persists in animal populations. Strengthening mass dog vaccination, improving surveillance systems, enhancing access to post-exposure prophylaxis, and reinforcing One Health collaboration are essential to achieve rabies elimination by 2030.

KEYWORDS: Rabies cases; Vaccination coverage; Elimination target by 2030; Tanzania

OR-NTD-05

Single-visit ChAdOx2 RabG vaccination elicits stronger protective immune responses than licenced vaccine: interim results from the RAB002 phase Ib/II clinical trial.

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Background: Current rabies vaccines require multiple doses and are expensive, resulting in poor access and around 59, 000 deaths per year. Pre-exposure prophylaxis (PrEP) is generally considered to not be cost effective in most endemic settings, although it is recommended for wealthy travellers. Where PrEP has been used (e.g., in the Peruvian Amazon) rabies cases have plummeted, demonstrating its effectiveness. Here we present the

interim results of the RAB002 phase Ib/II clinical trial evaluating the safety and immunogenicity of the novel, replication incompetent, viral vectored ChAdOx2 RabG vaccine in Bagamoyo, Tanzania.

Methods: Healthy adults (18-45 years) and children (2-6 years) are enrolled and will be followed-up for 5 years (3 years are complete). Adults received single-visit vaccination with either ChAdOx2 RabG or a currently licensed inactivated rabies vaccine (IRV). Children received either one of these single-visit regimens, or a two-visit, WHO recognised PrEP regimen. Virus neutralising antibody (VNA) levels are measured using an internationally recognised assay. A result ≥ 0.5 IU/mL indicates seroconversion and an adequate response to vaccination.

Results: All participants receiving a single dose of the ChAdOx2 RabG vaccine seroconverted and most have maintained seropositivity over multiple years, as have children receiving two-visit PrEP. Not all participants receiving a single dose of IRV seroconverted and many who did have not remained seropositive. The VNA responses in the single-visit ChAdOx2 RabG groups were stronger than either single-visit or two-visit IRV groups.

Conclusion: Cheaper rabies vaccines and less-onerous regimens for PrEP and PEP have the potential to improve access and limit the impact of rabies in terms of mortality and financial burden. ChAdOx2 RabG is cheap to manufacture, showing it has potential for use as single-visit PrEP. We are also exploring its potential for use alongside IRV as a new, single-visit PEP regimen, which could replace the need for three-visit PEP.

KEYWORDS: Rabies; Vaccine; ChAdOx2 RabG; Ifakara Health Institute

OR-NTD-06

Mapping the Epidemiology of Epilepsy and Onchocerciasis-Associated Epilepsy in Mahenge, Tanzania

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Background: Increased prevalence and incidence of epilepsy have been reported from regions with ongoing onchocerciasis transmission. Epidemiological evidence suggests that *Onchocerca volvulus* may directly or indirectly contribute to the development of Onchocerciasis-Associated Epilepsy (OAE). This study from Mahenge focuses on assessing the overall burden of epilepsy.

Methods: A door-to-door cross-sectional epilepsy screening was conducted between August and November 2021, covering 34 villages in the Mahenge. Screening used a two-stage approach: first, community health workers administered a standardised five-item questionnaire; then, a physician evaluated individuals with suspected epilepsy to confirm or refute the diagnosis. OAE was identified using established clinical criteria. Descriptive statistics were used to analyse the data, supplemented by bivariate and multivariate techniques to explore the association.

Results: Fifty-six thousand six hundred four individuals were screened, and 1,946 tested positive. Of these, 1,809 (93%) were available for confirmation, and 1,194 (66%) were confirmed to have epilepsy, giving a prevalence of 21.1 cases per 1,000 population (95%CI: 19.9–22.3). Six hundred and ten of the positive (31.3%) were diagnosed with other health conditions, mostly recurrent febrile convulsions (17%) and dizziness/syncope (13%). The overall prevalence of Ov16 seropositivity among people with epilepsy was 54.1%. Of the confirmed cases, 447 (37.4%) were eligible for OAE assessment, of whom 338 (75.6%; 95%CI: 71.4–79.5) were confirmed as OAE, and 132 individuals (11.0%; 95%CI: 9.3–13.0) presented with nodding syndrome (NS). Of them, 37.8% were not receiving antiseizure medication.

Conclusion: There is a high prevalence of epilepsy in the Mahenge. A significant proportion of people with epilepsy cases were identified to have OAE or NS, which highlights an epidemiological link between ongoing onchocerciasis transmission and neurological morbidity. Over a third of people with OAE were not receiving medication. This indicates an urgent need for improved access to epilepsy care. **Keywords:** *Onchocerca volvulus*, prevalence, river epilepsy, nodding syndrome

A longitudinal evaluation of serological prevalence threshold for stopping mass drug administration for Onchocerciasis elimination in the Tukuyu focus

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Background: Onchocerciasis elimination strategies rely primarily on mass drug administration (MDA) with ivermectin over multiple years to interrupt transmission. The World Health Organization (WHO) recommends that programs consider stopping MDA only when both entomological and serologic prevalence criteria are met. However, the current WHO-recommended serologic threshold of $<0.1\%$ is operationally challenging and may be more stringent than necessary. We conducted a study to evaluate whether we could safely stop MDA at serologic threshold of $\leq 2\%$.

Methods: A 5-years study included baseline year (2020) to confirm Tukuyu focus as study site for stopping MDA, two assessments years (2022, 2024) of post-treatment surveillance (PTS), and end line year (2025). At baseline, 2,084 children aged 5-9 years were tested by Ov16 rapid diagnostic test (RDT) and Ov16 ELISA and/or Ov16m ELISA for Ov16 antibodies from collected dried blood spots. During PTS, 809 and 806 children from 8 purposively selected first-line villages were tested in 2022 and 2024, respectively. At end-line, 2,074 children from 30 villages were tested. Concurrently, blackflies were also collected at eight catch sites using human landing collection method and tested by qPCR for O-150 and OvND5.

Results: Baseline seroprevalence was 1.21% by Ov16 ELISA, 0.14% by Ov16m ELISA, and 0.05% by RDT. In 2022 and 2024, seroprevalence was 0.12% by RDT and Ov16m ELISA. At end-line, no child (0.00%) was found positive. Entomological assessments during baseline no evidence of *Onchocerca volvulus* infection in 3,726 blackflies in 2021, 11,947 in 2024 and 8,510 in 2025.

Conclusion: Based on study findings, the Tukuyu focus stopped MDA according to study criteria, completed the three-year WHO-recommended PTS period, and underwent a final evaluation with no evidence of recrudescence. These results provide additional evidence that stopping MDA at a serologic threshold of $\leq 2\%$ may be safe and may not result in residual transmission.

KEYWORDS: Onchocerciasis; elimination; Tukuyu focus; mass drug administration (MDA); serologic

High prevalences on *Onchocerca volvulus* in field-collected blackflies from Southeastern Tanzania

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Background: Onchocerciasis, also known as river blindness, is a neglected tropical disease that remains endemic in Southeastern Tanzania despite decades of mass drug administration (MDA) with ivermectin. As programs shift from control to elimination, effective surveillance becomes critical. Verification of transmission interruption primarily relies on detecting infections in humans using skin snip microscopy, serology (Ov16 antibody tests), or PCR on blackflies targeting the mitochondrial DNA marker OvND5. PCR-based vector surveillance, while highly sensitive, is expensive, requires complex logistics, and is difficult to scale up in resource-limited settings. As a result, surveillance programs have prioritized detecting infection in humans, with less focus on vectors, which leaves gaps in assessing ongoing transmission in vectors. In low-transmission contexts with rare and focal

infections, these challenges become even more acute and could undermine elimination goals. The aim of this study was to assess the infection rate of field-collected blackflies from onchocerciasis-endemic villages in Ulanga district.

Methods: We collected ~17,000 blackflies (*Simulium* spp.) across eight villages using Human Landing Catch (HLC), Esperanza Window Traps (EWT), and Miniaturized Double Net Traps (DN-mini) from May 2023 to June 2024. We used a standardized sampling frames which included riverside and peri-domestic catch points, with monthly collections across rainy and dry seasons. We performed a real-time PCR assay on the blackfly DNA targeting the mitochondrial OvND5.

Results: Out of the first 5000 blackflies tested, 119 were confirmed positive for *O. volvulus* (~2.4%), indicating active ongoing transmission.

Conclusion: These findings indicate persistent transmission foci despite long-term MDA. Incorporating vector PCR into national surveillance will help to identify hotspots requiring intensified or biannual MDA, optimize timing of treatment relative to seasonal biting peaks, prevent premature cessation of MDA in villages with persistent positives and guide integration of larval source management (LSM) where vector positivity remains high.

KEYWORDS: Onchocerciasis; black flies; transmission; southeastern Tanzania.

OR-NTD-09

Onchocerciasis vector species composition, biting patterns and vector infectivity two decades post- Mass Drug Administration (MDA) in Ruvuma Focus, Tanzania.

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Background: In Tanzania, onchocerciasis remains a significant public health concern, with over seven million individuals at risk of infection across 29 districts in eight regions, which constitute eight transmission foci, including the Ruvuma focus. It is important to regularly update information on the composition of vector species and their biting patterns, and to assess *Onchocerca volvulus* infections in blackflies. This will enable us to detect changes in disease epidemiology early, suggest possible vector control strategies, conduct disease surveillance, and accelerate elimination efforts. This study aimed to investigate the Onchocerciasis vector species composition, biting patterns and vector infection status two decades post-Mass Drug Administration (MDA).

Methods: The study employed a repeated cross-sectional entomological design. River prospections were carried out through surveys of rivers, streams, and river tributaries, and adult blackflies were collected using human landing catches (HLCs) at six established catching sites (CSs) in December 2025 and January 2026. The collected flies were identified morphologically using existing dichotomous keys, then screened for *O. volvulus* using O-150/Ov-ND5 qPCR in pools of up to 100 heads. Vector infectivity rates were estimated using maximum likelihood estimation (MLE).

Results: A total of 6,026 *Simulium damnosum* s.l. flies were collected. The highest abundance was recorded in January 2026 (55%), specifically in Mtua village (38%). Out of the 63 blackfly head pools analysed, 33 (52%) tested positive for *O. volvulus*. Mgazini village had the highest pool positivity rate (100%), while Mpepai had the lowest (8%). The overall estimated individual vector infection rate (MLE) was 0.74% (95% CI: 0.51–1.02).

Conclusion: The findings of this study showed that *Simulium damnosum* s.l. remains the principal vector responsible for transmitting human onchocerciasis in the Ruvuma Focus. Also, it is clear that transmission is active and ongoing in the focus. Therefore, continuous longitudinal entomological surveillance is recommended to accelerate onchocerciasis elimination.

KEYWORDS: Onchocerciasis; *Simulium damnosum* s.l. Ruvuma focus; Vector infectivity; O-150/Ov ND5 q PCR; Pool screening; Maximum Likelihood Estimation (MLE); Mass Drug Administration (MDA).

Schistosome Infection is Associated with High-Risk Human Papillomavirus Persistence, Together with Altered Cervicovaginal Microbiota

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Background: Schistosoma haematobium infection has been implicated in impairing mucosal antiviral immunity, potentially influencing the persistence of high-risk human papillomavirus (HR-HPV), a necessary precursor to cervical cancer. This study investigated the association between schistosome infection, cervicovaginal microbiota, and HR-HPV persistence among women in Tanzania.

Methods: We analysed prospectively collected samples from 96 HIV-negative women with paired baseline and 9-12-month follow-up data. HR-HPV genotyping was performed using multiplex PCR, schistosome infection was assessed using circulating anodic antigen (CAA) detection, and cervicovaginal microbiota composition was characterized using 16S rRNA gene sequencing. HR-HPV persistence was defined as detection of the same genotype at both time points. Logistic regression and Fisher's exact tests were used to assess associations.

Results: At baseline, 66% of participants had HPV infection, with 81% of these harbouring HR-HPV. Among women with HR-HPV, 12 demonstrated persistence at follow-up. End line schistosome infection was significantly associated with HR-HPV persistence (OR 4.7, 95% CI 1.3-16.5, p=0.017). In microbiota analyses, women with persistent HR-HPV were more likely to exhibit Gardnerella-dominant communities (33% vs. 8%, p=0.049) and had higher relative abundance of Gardnerella, alongside reduced Lactobacillus dominance. Subgroup analyses suggested that associations were stronger in Schistosoma haematobium-endemic settings compared to Schistosoma mansoni-endemic areas. These findings provide novel evidence linking schistosome infection and cervicovaginal dysbiosis with HR-HPV persistence. Potential mechanisms include mucosal barrier disruption, immune modulation that impairs antiviral responses, and microbiota alterations that promote viral persistence.

Conclusion

Conclusion: schistosome infection, particularly S. haematobium, together with altered cervicovaginal microbiota, may contribute to sustained HR-HPV infection and increased cervical cancer risk in endemic regions. Integrated control strategies targeting parasitic infections and reproductive tract health may help reduce the cervical cancer burden in sub-Saharan Africa.

KEYWORDS: S. haematobium; high-risk human papillomavirus; cervicovaginal dysbiosis

Community Perceptions of Mass Drug Treatments for Schistosomiasis and Strategies to Increase Treatment Coverage in Mwanza Region, Tanzania

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Background: Schistosomiasis is a significant public health issue in Tanzania, with some areas reporting a prevalence rate as high as 100%. Praziquantel is widely used for preventive chemotherapy for schistosomiasis, effective against all *Schistosoma* species. Despite repeated mass drug administration (MDA) campaigns to combat disease in Mwanza Region, Schistosomiasis remains transmitted. However, limited evidence exists about the community's perceptions of mass drug treatment and how these perceptions influence treatment coverage and the control of schistosomiasis. Aim: The Study aimed to explore community perceptions of mass drug treatment for schistosomiasis and identify strategies to increase treatment coverage in selected villages in Mwanza Region.

Methods: A cross-sectional descriptive mixed-methods study was conducted in 2016 in Lutale and Fogofogo villages, Mwanza. A total of 387 participants completed structured questionnaires and semi-structured interviews. Qualitative data were collected through six Focus Group Discussions and twelve In-depth Interviews. Quantitative data were analysed using STATA version 12, while qualitative data were analysed using thematic content analysis.

Results: The community's knowledge of schistosomiasis was low, with only 19.63% (75/382) of participants being aware of the disease. However, a higher percentage, 74.16%, were informed about mass drug treatments for schistosomiasis. Traditional medicine accounted for only 4.42%. Knowledge of schistosomiasis was significantly associated with uptake of praziquantel ($P < 0.001$). Qualitative findings indicated generally positive attitudes toward mass drug treatment, driven by perceived health benefits and prior experience with the program. However, worries about side effects, risk of causing male dysfunction, limited understanding of disease transmission, and inconsistencies in drug distribution were reported as barriers to participation.

Conclusion: While acceptance of mass drug administration is high, limited knowledge of schistosomiasis and ongoing community concerns restrict optimal treatment coverage. Addressing knowledge gaps, treatment-related fears, and drug delivery challenges is essential to improve uptake and strengthen schistosomiasis control efforts in Tanzania

KEYWORDS: Schistosomiasis; Mass drug treatment; Community; Perception; Tanzania

OR-NTD-12

The prevalence of male and female urogenital schistosomiasis, risk factors and associated morbidities in meatu district, northwestern Tanzania

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Background: Urogenital schistosomiasis (UGS) caused by *S. haematobium* is endemic in the north-western region of Tanzania. In women, *S. haematobium* may cause Female genital schistosomiasis (FGS) characterized by vaginal discharge, pelvic pain, genital burning, dyspareunia, dysuria and increase the risk of HIV transmission, infertility, and adverse pregnancy outcomes. For Male genital schistosomiasis (MGS), men experience pelvic, ejaculatory pain, haemospermia, genital swelling, and infertility and yet limited data. The National control programs target school-aged children through mass drug administration, leaving adults behind. This study aimed to determine the prevalence of male and female urogenital schistosomiasis infection, risk factors and associated morbidities in northwestern Tanzania.

Methods: A community-based cross-sectional study conducted among adults (≥ 18 years) from 6 villages in Maswa district, Simiyu region. Risk factors were collected by using closed-ended questionnaire. Urine samples examined microscopically using the urine filtration technique. Urological ultrasonography was performed to assess urogenital schistosomiasis-related morbidities and colposcopy for FGS.

Results: A total of 830 participants (51.4% males and 48.6% females) were screened, and the overall prevalence of urogenital schistosomiasis was 9.3% (95%CI: 7.481, 11.452), significantly higher in male 13.6% (95%CI: 10.641, 17.183) than women 4.7% (95%CI: 3.023, 7.282) ($p < 0.001$). Among infected, 79.2% had light and 20.8% had heavy *S. haematobium* infection. Age, sex, village, frequency of water contact and reason for water contact were significantly associated with *S. haematobium* infection, while occupation, education, history of water contact, and duration of residence were not. The prevalence of FGS was 16.8% (95%CI: 13.337, 20.941). In ultrasound results, 29.3% (95%CI: 26.181, 32.546) presented with urological abnormalities consistent with urogenital schistosomiasis. The prevalence of abnormalities was significantly higher in women 49.2% (95%CI: 44.050, 54.319) than men 12.1% (95%CI: 9.297, 15.567) ($p < 0.001$).

Conclusion: These findings highlight the need to integrate community MDA in national programs, strengthen community-based screening, and gender-sensitive control strategies to reduce the impact of UGS in endemic areas.

KEYWORDS: Urogenital schistosomiasis; *Schistosoma haematobium*; prevalence; risk factors; morbidities

OR-NTD-13

Integrating healthcare services for female genital schistosomiasis with the delivery of paediatric praziquantel in Tanzania: Is it feasible?

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Background: Female genital schistosomiasis (FGS) is a chronic gynaecological condition resulting from *Schistosoma haematobium* infection, affecting over 40 million women and girls in the worldwide, mostly in sub-Saharan Africa. FGS has long been neglected and continues to disease affect women in endemic areas. In low- and middle-income countries such as Tanzania, diagnosis and treatment of FGS remain challenging due to limited healthcare capacity for neglected tropical diseases (NTDs), leaving many women untreated and at risk of complications. The upcoming distribution of paediatric praziquantel (arPZQ) through routine healthcare offers an opportunity to integrate FGS services into existing systems.

Objective: This study aimed to assess the feasibility of integrating FGS diagnosis and treatment with arPZQ delivery using a mother-child integrated model.

Methods: A cross-sectional study used mixed qualitative and quantitative methods.

Results: Integrating FGS services with the delivery of arPZQ was supported by healthcare workers (HCW) and the communities as a feasible strategy, provided that diagnostic and treatment capacities at the primary healthcare facilities are strengthened. Over 70% of HCWs lacked awareness and experience in FGS diagnosis and management, leading to frequent misdiagnosis as urinary tract infection, sexually transmitted infections, or fungal infections, and resulting in ineffective treatment. Communities were also largely unaware of FGS and its symptoms. Recurrent symptoms and treatment failure negatively influenced health seeking behavior, with many women resorting to traditional remedies without success. However, after gaining awareness, women expressed their willingness to seek care at nearby facility, while HCWs showed readiness to deliver integrated services.

Conclusion: Integrating FGS and paediatric schistosomiasis services is feasible. The diseases share common etiology, diagnostic approaches, and system level challenges; therefore, addressing the gaps in paediatric schistosomiasis care provides an opportunity strengthen FGS services.

KEYWORDS: FGS; paediatric praziquantel; schistosomiasis; integrated services

Mapping of snail intermediate host habitats reveals variability in schistosome and non-schistosome trematode transmission in an endemic setting

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Background /

Introduction: The intermediate snail host of *Schistosoma haematobium*, the etiological agent of urogenital schistosomiasis, serves as a critical sentinel for tracking the spread of associated disease risks, in addition to *S. haematobium*, *Bulinus* spp. Snails also transmit *S. bovis* to cattle, as well as several non-schistosome trematodes to cattle and wildlife. Identifying transmission foci of these multi-parasite hosts is critical for targeted and effective One Health intervention.

Methods: We investigated 467 waterbodies in 86 villages from Simiyu, Mwanza, and Shinyanga regions in northwestern Tanzania. A total of 43,348 *Bulinus nasutus* were collected across three survey phases from November 2020 to August 2021. Generalized linear mixed models with binomial error distributions estimated snail presence, schistosome, and non-schistosome prevalence.

Results: Across all snails, 0.63% were emitting schistosome cercariae. There was a significant increase in schistosome prevalence during the year, with a peak in the dry season (June–August 2021). Furthermore, of the 25,052 snails collected in the latter two phases (March to August 2021), 4.9% were infected with non-schistosome trematodes, exceeding prevalences of schistosomes at all spatial scales. Co-infections were uncommon, with only 0.05% of snails concurrently emitting both schistosome and non-schistosome parasites. These infection patterns were consistent across village and district levels. Waterbodies used by cattle had higher schistosome prevalence than waterbodies isolated for human use. Surprisingly, non-schistosome prevalence was equal in both of these waterbody types.

Conclusion: This suggests that cattle have an indirect role in schistosome transmission, requiring the separation of waterbody usage between cattle and humans and extending snail control in dry season to waterbodies used by cattle. By contrast, water permanence and school proximity did not impact snail or parasite presence. Targeted interventions should focus on local water use dynamics, with attention to the potential indirect role of cattle in schistosome transmission.

KEYWORDS: *Bulinus nasutus*; *Schistosoma haematobium*; Habitat; Waterbody; Transmission; Simiyu; Mwanza and Shinyanga

Burden, and socio-demographic predictors of schistosomiasis among school children in western Tanzania, 2021

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Introduction: Schistosomiasis remains a major public health problem in Tanzania, particularly in communities around the Lake Victoria basin where frequent freshwater contact sustains transmission. School-aged children are disproportionately affected. In 2021, routine school deworming reports indicated persistent transmission in several districts of the Lake- Western Zone. We assessed the prevalence and socio-demographic predictors of schistosomiasis among primary school children in Mwanza, Shinyanga, and Simiyu regions.

Methodology: A cross-sectional survey in 2021 among primary school children from Mwanza, Shinyanga, and Simiyu regions was conducted. Socio-demographic characteristics and water-use behaviors were collected using

structured questionnaires. Stool and urine samples were examined for *Schistosoma* infection using standard parasitological techniques. Modified Poisson regression with robust variance estimation was used to calculate crude and adjusted prevalence ratios (cPR and aPR) with 95% confidence intervals (CIs) to identify factors associated with infection.

Results: A total of 7800 children were enrolled, of whom 790 (10.1%) were infected with schistosomiasis. In multivariable analysis, children aged 12–19 years had a higher prevalence than those aged 5–11 years (aPR = 1.01, 95% CI: 1.003–1.02). Male children had a higher prevalence compared to females (aPR = 1.02, 95% CI: 1.01–1.03). Children who did not use lake water had a significantly lower prevalence than those who used it (aPR = 0.699, 95% CI: 0.66–0.73). Residence in Simiyu region was associated with a higher prevalence compared to residence in Mwanza and Shinyanga (aPR = 1.04, 95% CI: 1.03–1.06).

Conclusion: Schistosomiasis remains endemic among primary school children in the Lake-Western Zone, with higher prevalence among older children, males, lake water users, and residents of Simiyu region. Targeted interventions focusing on behavioral change, improved water and sanitation access, and sustained mass drug administration are essential for effective control.

KEYWORDS: school; children; predictors; schistosomiasis

OR-NTD-16

Urogenital schistosomiasis and male reproductive health: A community-based study on semen quality and associated factors among men in Northwest Tanzania

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Background: urogenital schistosomiasis (UGS), caused by a blood dwelling parasite *Schistosoma haematobium* is a major public health challenge across sub-Saharan Africa. While urinary tract pathology to this infection is well documented, the consequences for male genital health and semen quality remain insufficiently characterized, particularly within community based setting in Tanzania.

Methods: A community based cross-sectional study was conducted between August, 2023 and September, 2024 in Maswa district, Northwest Tanzania. A total of 134 reproductive and adult participants aged 16–74 years were enrolled through a multistage sampling across three wards. Assessments included parasitological examination of urine through filtration technique and semen quality analysis using the WHO standard for seminal analysis and a structured questionnaire was used to collect data and information on demographic characteristics and family and reproductive information.

Results: A half of study participants were aged (52.2% aged 16–34 years), with most participants being farmers (93.3%), and long-term residents (96% residing >2 years). The prevalence of male genital schistosomiasis (MGS) and urogenital schistosomiasis (UGS) were 3.57% and 3.7% respectively. Elevated blood pressure was recorded in 44% of participants. Semen samples were obtained from 28(20.9%). Among these, 72.0% had sperm count below WHO reference threshold Oligozoospermia <39, 25.9% showed reduced sperm motility (<40%), Factors associated with UGS infection were marital status were being single was significantly associated with UGS positivity.

Conclusion: Men in this UGS endemic district have low prevalence of UGS and they show a suboptimal semen quality compounded by elevated blood pressure. Integrated schistosomiasis control programs incorporating male reproductive health screening are urgently indicated. Longitudinal studies with larger semen samples sizes are needed so as to establish causal relationship and to assess the effect of anti-schistosomal treatment on semen quality outcomes

KEYWORDS: Urogenital schistosomiasis; male genital schistosomiasis; semen quality; male reproductive health; sperm motility; Tanzania

OR-NTD-17

Impact of removing cattle manure-laden soil from waterbodies on schistosome ecology

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Background: Schistosomiasis is an infectious disease caused by waterborne worms that infect more than 150 million people. Before infecting humans, schistosomes must first infect intermediate snail hosts, with larger snails and snails in nutrient-rich environments releasing more schistosomes, thereby increasing human infection risk. Around Lake Victoria in Tanzania, a significant source of waterbody nutrient load comes from ranging herds of livestock that excrete nutrient-rich manure into waterbodies. This manure remains in waterbody sediment and may serve as a nutrient repository for snail and parasite growth. Interventions that reduce this manure-laden sediment may aid in schistosomiasis control.

Methods: We evaluate the impact of waterbody cleaning interventions on snail and schistosome dynamics in communities around Misungwi, Sengerema, and Busega districts in northwestern Tanzania. We hypothesized that removing manure-rich sediment from waterbodies would reduce snail abundance, infection prevalences, and schistosome production. In September 2024, we conducted manure-laden soil removal interventions in 11 waterbodies that we have monitored with monthly snail and schistosome surveys since 2021. Over the next 18 months post-intervention, we continued monthly surveys and then compared snail abundances, infection prevalence, and parasite release rates pre- and post-intervention using generalized additive mixed models.

Results: Preliminary analyses show statistically significant decreases in snail population abundances in intervention waterbodies but no changes in the timing of snail population dynamics. Conversely, overall snail infection prevalences do not significantly differ between intervention and control waterbodies, but infection prevalences in intervention waterbodies peak later in the season and decline faster compared to control waterbodies, which exhibit more consistent infections throughout the year. We observed no differences in per capita parasite release rates between groups.

Conclusion: Our results suggest that soil remediation interventions may offer an approach to modulate schistosome dynamics in waterbodies around northwestern Tanzania while contributing to our understanding of how nutrient dynamics influence schistosome ecology.

KEYWORDS: schistosomiasis; ecology; nutrient dynamics; Tanzania

OR-NTD-18

Hidden Burdens: Zoonotic Schistosomiasis and Fascioliasis beyond School-Based Control in Tanzania

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Background: Neglected tropical diseases (NTDs) remain a major public health concern in sub-Saharan Africa. While schistosomiasis control in Tanzania has largely focused on school-based mass drug administration (MDA), other trematode infections, such as fascioliasis, remain neglected in policy, surveillance, and routine healthcare. Moreover, adults and preschool-aged children, who are key contributors to transmission, are often excluded from preventive chemotherapy. Evidence on the true burden of zoonotic trematode infections across age groups is limited.

Methods: We conducted cross-sectional epidemiological surveys in Lake Victoria and the Southern Highland ecological zones of Tanzania. A total of 1557 stool and urine samples were collected from preschool-aged children, school-aged children, and adults. Standard parasitological techniques were used to detect *Schistosoma mansoni* (*S. mansoni*), *Schistosoma haematobium* (*S. haematobium*) and *Fasciola* spp. Data were analysed to estimate prevalence patterns across age groups, sex, and ecological settings.

Results: Zoonotic schistosomiasis and fascioliasis were detected across all age groups, including populations not targeted by MDA programs. The overall prevalence of *S. haematobium* based on the urine filtration technique was 4.9%. Age-stratified prevalence was 5.1%, 4.5% and 5.0% for adults, school-aged children and pre-school children, respectively. The overall prevalence of *S. mansoni* infection was 1.2%. Age-stratified *S. mansoni* prevalence was 0.9%, 1.1% and 1.8% for adults, school-aged children and pre-school children, respectively. Regarding fascioliasis, the overall prevalence was 0.9%. Age-stratified prevalence was 1.4%, 0.5% and 1.3% for adults, school-aged children and pre-school children, respectively.

Conclusion: Our findings demonstrate that zoonotic trematode infections remain hidden yet persistent in Tanzanian communities. Current school-based NTD control strategies are insufficient to interrupt transmission. Inclusion of fascioliasis in national NTD frameworks, expansion of surveillance beyond school settings, and integration of diagnosis into routine healthcare are urgently needed to achieve equitable and sustainable NTD control.

KEYWORDS: Neglected tropical diseases; schistosomiasis; fascioliasis; zoonotic infections; snails; public health; Tanzania

OR-NTD-19

Stocking African catfish in Lake Victoria provides effective biocontrol of snail vectors of *Schistosoma mansoni*

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Introduction: Schistosomiasis is the second most impactful parasitic disease after malaria, affecting over 200 million people globally, with more than 90% of cases occurring in sub-Saharan Africa. In Tanzania, *Schistosoma mansoni* and *Schistosoma haematobium* are the dominant species, and the Lake Victoria basin remains a major transmission hotspot, driven by intense human-water contact and favourable snail habitats. Current control strategies rely heavily on preventive chemotherapy with Praziquantel, which does not target environmental transmission reservoirs. Biological control using natural predators of intermediate host snails is emerging as a complementary approach, but field-based evidence remains limited. Study

Objective: To evaluate whether restoration of the native fish *Clarias gariepinus* can reduce the abundance of *Biomphalaria* snails and decrease *Schistosoma mansoni* infection intensity among school-aged children.

Methodology: A Before-After-Control-Intervention (BACI) design was implemented from 2019 to 2023 across seven lakeside sites (three intervention, four control). Catfish populations were restored in intervention areas. Snail abundance was monitored through standardised sampling, while infection intensity was assessed in school-aged children using stool egg counts. **Results and Interpretation:** Intervention sites showed a 57% reduction in snail abundance (95% CI: 29.4–74.3%) and a 55% reduction in infection intensity among children (95% CI: 26–73%). These findings indicate a strong ecological linkage between predator presence, reduced snail populations, and decreased transmission risk. **Limitations:** Follow-up duration was limited, and participant tracking was not longitudinal. Prepatent snail infections were not assessed, and behavioural or WASH-related confounders were not fully captured. Fish movement dynamics also remained unquantified. **Conclusion and Discussion:** Restoration of native catfish significantly reduced snail populations and schistosomiasis burden in SAC. These findings support biological control as a viable complement to mass drug administration. Scaling this approach will require integration with ecological monitoring, behavioural data, and long-term evaluation of sustainability and impact.

KEYWORDS: Schistosomiasis; Biological control; Biomphalaria; Clarias gariepinus; Lake Victoria

OR-NTD-20

Survey of *Schistosoma haematobium* and *Schistosoma bovis* infections in human and freshwater snail populations in Simiyu, Tanzania

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Introduction: Schistosomiasis remains a major neglected tropical disease across sub-Saharan Africa. The World Health Organization emphasises regular surveillance and integrated One Health approaches, particularly to understand the role of hybrid schistosomes in transmission dynamics. This study aimed to establish baseline data on *Schistosoma haematobium* and *Schistosoma bovis* infections in humans and *Bulinus* snails in the Simiyu region, northwestern Tanzania.

Methods: A cross-sectional survey was conducted among school-aged children in Bariadi, Busega, Maswa, and Meatu districts. Single urine samples were collected and examined for *Schistosoma* eggs using urine filtration and microscopy. Hatched miracidia were preserved on Whatman FTA cards for molecular analysis. *Bulinus* snails were collected from freshwater habitats and screened for cercarial shedding. Shed cercariae were similarly preserved for molecular characterisation. Genetic profiling of individual miracidia and cercariae was performed using mitochondrial *cox1* and nuclear ITS markers.

Results: A total of 970 miracidia from 97 infected participants were successfully genotyped, all showing a *S. haematobium* genetic profile. Among 160 *Bulinus* snails shedding cercariae, 840 cercariae from 84 snails were analysed. Of these, 82.1% shed *S. bovis*, 15.5% shed *S. haematobium*, and 2.4% (2/84) shed cercariae with mixed *S. haematobium-bovis* genetic profiles.

Conclusion: The findings confirm ongoing transmission of *S. haematobium* among humans in Simiyu. The high proportion of *S. bovis* in snails suggests a significant burden of livestock schistosomiasis, while the detection of *S. haematobium-bovis* hybrids, though rare, indicates potential complexity in transmission dynamics. These results underscore the importance of integrated One Health strategies addressing human, animal, and environmental reservoirs to improve schistosomiasis control in the region.

KEYWORDS: Schistosomiasis; children; snails

Magnitude and Patterns of Urinary Tract Morbidities Attributable to *Schistosoma haematobium* Among School-Aged Children in Simiyu, Tanzania

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Background: *Schistosoma haematobium* infection remains an important cause of urinary tract morbidity among school-aged children in endemic areas of northwestern Tanzania, yet the current burden of related pathology following years of preventive chemotherapy is not well characterized. This study assessed the magnitude of urinary tract morbidities attributable to *S. haematobium* among schoolchildren in Simiyu Region.

Methods: An analytical cross-sectional study was conducted among 2994 school children aged 5–17 years in Simiyu. Urinary tract morbidity was evaluated using urine reagent dipsticks for haematuria and ultrasonographic examination following World Health Organization Niamey guidelines to detect bladder, ureter, and kidney abnormalities. Data were analysed using STATA version 15.

Results: The prevalence of microhaematuria was 18.5%, while macrohaematuria was observed in 2.4% of participants. Ultrasound-detectable urinary tract abnormalities were identified in 9.9% of children, predominantly involving the urinary bladder, including wall irregularities and thickening. Ureteric abnormalities and renal involvement were each observed in 0.2% of participants. Bladder calcifications were present in 0.9% of children. Haematuria, male sex, and heavy infection intensity were significantly associated with ultrasound-detected urinary tract abnormalities.

Conclusion: A considerable burden of *S. haematobium*-related urinary tract morbidity persists among schoolchildren in Simiyu despite ongoing control efforts. Most morbidity is concentrated in the lower urinary tract, particularly the bladder, and begins early in life. The high prevalence of microhaematuria and notable proportion of ultrasound-detectable abnormalities highlight ongoing subclinical and clinical disease. These findings emphasize the need for integrating morbidity assessment, including routine ultrasound screening, into schistosomiasis control programs to enable early detection and management of urinary tract complications in affected children. Targeted interventions are essential to reduce long-term morbidity and prevent complications.

KEYWORDS: Schistosomiasis; children; ultrasound; morbidity

Leave No One Behind: Rethinking Persistent Gaps in Schistosomiasis Control in Tanzania

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Background: Neglected tropical diseases (NTDs) such as schistosomiasis remain major public health problems in many parts of the world. About 85% of the global burden of schistosomiasis is found in Sub-Saharan Africa. Despite decades of Mass Drug Administration (MDA) using praziquantel, schistosomiasis remains endemic in Tanzania, particularly in the Lake Zone.

Methods: The global mantra of "Leave No One Behind" (LNOB) suggests an inclusive trajectory toward elimination. However, this paper argues that current interventions are structurally exclusionary, primarily focusing on School-Aged Children (SAC) while leaving behind other high-risk groups. These include Pre-School Aged Children (PSAC), mobile populations such as migratory pastoralists, and other underserved communities, which complicate the effectiveness of one-size-fits-all interventions.

Results: This paper adopts a qualitative, narrative-based research design grounded in critical policy analysis and evidence synthesis. It integrates secondary data review with expert interpretation to examine persistent challenges in controlling schistosomiasis in Tanzania. A comprehensive literature review was conducted using peer-reviewed databases, including PubMed, Scopus, and Web of Science, alongside grey literature from institutional reports. Key search terms included schistosomiasis, prevalence, integrated intervention, migration, One Health, climate change, mass drug administration, WASH, and zoonotic transmission.

Conclusion: This review explores gaps in national health security and proposes a shift toward precision public health to achieve equitable and sustainable disease control. It highlights critical clinical and policy gaps and outlines strategic directions for strengthening national health security systems in Tanzania. To move from rhetoric to reality, the paper argues for targeted, multi-sectoral interventions that treat the environment with the same urgency as the patient.

KEYWORDS: Schistosomiasis; Prevalence; Integrated intervention; Tanzania

OR-NTD-24

Correlation of serum screening and neuroimaging studies: a comparative analysis for diagnostic evaluation of neurocysticercosis among people with epilepsy attending mental health clinics in selected district hospitals of Tanzania.

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Background: Epilepsy is a considerable public health issue, particularly affecting individuals in low-income and middle-income countries, with *Taenia solium* neurocysticercosis (NCC) being responsible for an estimated 30% of preventable epilepsy cases in these areas. This study aimed to assess the prevalence of NCC in people with epilepsy (PWE), identify any cognitive impairments, and evaluate contributing factors.

Methods: Cross-sectional study in rural Tanzania. Whereby PWE were recruited from mental health clinics. Blood sample was collected for *T. solium* cysticercosis (CC) serology testing. Patients who were serologically positive for CC and those detected to have prominent neurological deficits apart from epilepsy were invited to receive a cerebral computed tomography (CT) examination.

Results: A total of 221 PWE recruited, whereby 26 (11.8%) had cognitive impairment, and 2 had neurological manifestations without cognitive impairment. 25(11.2%) PWE tested positive for CC, of which 4 had cognitive impairment. 198 (88.8%) tested negative for CC, of which 22 had cognitive impairment. 36 participants underwent CT scans, with 18 testing positive and 18 testing negatives for CC. Of the 36 who had CT scans, 8 (22.2%) were diagnosed with NCC; 7 were CC positive, and 1 was CC negative; only the latter had cognitive impairment. Multivariate logistic regression confirmed that cognitive impairment in PWE was 8.62 times higher for Kongwa than Chunya, with a statistically significant association (95% CI: 1.75, 156; $p=0.037$). Having an education was associated with a 91% reduction in the odds of cognitive impairment (OR = 0.09) compared to no education; statistically significant (95% CI: 0.01, 0.33; $p=0.002$). There was no association between cognitive impairment and NCC.

Conclusion: Prevalence of NCC among PWE is 22.2%, with cognitive impairment affecting 11.8% of this population, though not significantly associated with NCC. Socioeconomic and educational factors appear to have a more substantial impact on cognitive impairment among PWE.

KEYWORDS: Neglected diseases; Tanzania

A Phase 1, randomized, double-blind, placebo-controlled study in healthy adult participants.

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Background: Oxfendazole has long been used as an effective antiparasitic treatment in animals, and it is now being explored as a potential option for human use. As a young researcher, I was particularly interested in understanding how this medicine behaves in the human body, since evidence in humans is still limited. The study aimed to assess the pharmacokinetics, bioavailability, safety, and tolerability of a new oxfendazole tablet formulation in healthy adult volunteers.

Methods: We conducted a Phase 1, randomized, double-blind, placebo-controlled study involving healthy adults. The study was implemented in two parts: a single ascending dose phase followed by a multiple ascending dose phase. Participants were randomly assigned to receive either oxfendazole or a placebo. To understand how the drug moves through the body, blood samples were collected at predefined time points. Safety monitoring was a key focus throughout the study and included assessment of adverse events, laboratory investigations, vital signs, and electrocardiograms.

Results: Oxfendazole was generally safe and well tolerated at all dose levels studied. Most of the reported side effects were mild and temporary, and no serious adverse events were observed. We observed that drug exposure increased consistently with increasing doses, indicating predictable pharmacokinetics. The drug also showed a relatively long presence in the body, suggesting that once-daily dosing may be feasible. Importantly, repeated dosing did not result in unexpected accumulation, and overall safety findings were comparable to those observed in the placebo group.

Conclusion: The oxfendazole tablet formulation demonstrated a reassuring safety profile and predictable pharmacokinetic characteristics in healthy adults. These findings provide an important step forward and support further research to explore its potential role in the treatment of human parasitic infections.

KEYWORDS: Oxfendazole; Phase 1 study; pharmacokinetics; safety; tolerability; clinical trials.

Isolation of *Histoplasma capsulatum* from Bat Droppings-the Pathogen Responsible for Human Histoplasmosis: A Case Study Conducted in Mbeya, Tanzania.

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Background: *Histoplasma* is a genus of dimorphic fungi commonly found in bird and bat droppings. *Histoplasma capsulatum*, the causative agent of histoplasmosis, occurs worldwide and should be considered in patients presenting with unexplained pulmonary or systemic illnesses. In Tanzania, *H. capsulatum* infections have been reported in coastal regions, particularly in Tanga and Dar es Salaam. Chronic histoplasmosis can clinically resemble tuberculosis following exposure.

Methodology: This case study was conducted at NIMR-MMRC. Bat droppings were collected in Falcon tubes and transported to the laboratory for processing. An inoculum was prepared by adding 0.5 ml of 0.85% NaCl and vortexing. A few drops of the suspension were inoculated onto two Sabouraud dextrose agar plates. One plate was incubated at room temperature for several days, while the other was incubated at 37°C for 24 hours. Fungal

growth was examined both macroscopically and microscopically.

Results: At 37°C, cultures showed 2–3 mm wrinkled, moist, heaped, creamy yeast-like colonies. Gram staining revealed round to oval budding yeast cells. At room temperature, white, fluffy mold colonies were observed, which gradually turned brown to buff with age. Using the cellophane tape technique, mycelia with round microconidia were identified.

Conclusion: The findings confirmed the presence of *Histoplasma capsulatum*, the causative agent of histoplasmosis in humans. Chronic histoplasmosis may present with symptoms similar to those of *Mycobacterium tuberculosis*, which can lead to misdiagnosis. Preventive measures should be taken to minimize exposure to fungal spores, particularly in environments contaminated with bird or bat droppings.

KEYWORDS: Histoplasma; Bat droppings

PO-NTD-07

Soil-Transmitted Helminths Prevalence: Urging government to Sustain Deworming in Tanzania

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Background: Soil-Transmitted Helminths are parasitic intestinal Nematodes (*Ascaris lumbricoides*, *Trichuris trichiura*, hookworm and *Strongyloide stercoralis*) that infect humans through the ingestion of parasitic eggs or skin contact with motile larvae. The World Health Organization (WHO) has estimated that approximately 1.5 billion people worldwide are infected with Soil transmitted worms, these infections are among world's most common chronic diseases.

Objective: To determine the prevalence of Soil-transmitted Helminths among patients attending at Kabanga hospital, in Kasulu District.

Methodology: Prospective study was conducted in Kasulu Tanzania at Kabanga Hospital in 2022, A total of 200 stool samples collected randomly from suspected patients of both sex who attended at kabanga hospital. Formal ether concentration technique used to analyze stool and the result was calculated for prevalence.

Results: We found 30 patients with Soil-transmitted helminths (15with*Ascaris lumbricoides*,5with *Trichuris trichiura* and 10 with hookworm) equal to the overall prevalence of 15 %.

Conclusion: The 15 %. prevalence alerts the government to sustain deworming programs and community to improve hygiene practices.

KEYWORDS: Deworming; Soil Transmitted Helminths

PO-NTD-06

Integrating screening for parasitic diseases in antenatal care and vaginal self-sampling for female genital schistosomiasis during pregnancy in Bagamoyo district, Tanzania.

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Background: Neglected tropical disease (NTD) surveillance, including *S. haematobium* and female genital schistosomiasis (FGS) screening, often relies on school-based control programs that exclude adult women. Antenatal care (ANC) services are widely utilized in sub-Saharan Africa and offer a platform to integrate parasite screening with routine and earlier diagnosis and treatment.

Objective: This pilot study aimed to quantify the burden and consequences of malaria and NTDs (including FGS), among pregnant women in Bagamoyo, Tanzania. A secondary aim evaluated the acceptability of integrating parasite screening into ANC services.

Methodology: Women were enrolled from two communities between February 2024 and March 2025. Genital self-swabs, fingerpick blood, urine, and stool samples were collected from participants. The acceptability and feasibility of integrated screening and presumptive treatment were assessed quantitatively among participants and healthcare workers.

Results: In this pilot, schistosomiasis surveillance was successfully incorporated into routine workflows for 413 women at their first ANC visit, 94.2% (389/413) of whom contributed acceptability data. The acceptability of vaginal self-sampling for FGS screening was high (98%). The majority (82.1%, 321/391) reported that vaginal self-sampling was “easy” or “very easy” and 98.4% (385/391) thought parasite screening during pregnancy was important. The prevalence of active schistosomiasis, as measured by circulating anodic antigen (CAA), was low (7.7%, 32/413), and only one PCR-positive FGS case was detected. However, the younger age profile of ANC attendees (~40% under 25 years) aligns with the demographic at risk for FGS, a group underrepresented in traditional surveillance. Screening revealed a 4-fold higher prevalence of *Plasmodium falciparum* infection using molecular methods compared to routine RDTs, demonstrating that ANC-based molecular surveillance can uncover a substantial burden of subpatent infections early in pregnancy, prior to initiation of intermittent preventative treatment.

Conclusion: Although *Schistosoma* prevalence was low, integrated malaria and NTD screening within ANC is feasible and acceptable among pregnant women.

KEYWORDS: Neglected Tropical Diseases; Female Genital Schistosomiasis; Malaria in Pregnancy.

PO-NTD-05

Performance of diagnostic tests for the detection of *Schistosoma mansoni* infection in Mbeya, Tanzania

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Background: In a large-scale cohort study of the general population in an area with low endemicity for schistosomiasis, we used various diagnostic tests to detect *Schistosoma mansoni*.

Methodology: In 2019, blood, urine, and stool samples were collected from 1,264 individuals aged 14 to 65 years in Kyela, Southwest Tanzania. Kato-Katz microscopy (KK) of stool and urine-based Point of Care circulating

cathodic antigen (POC CCA) were performed to detect *S. mansoni* infection. Furthermore, selected samples were tested by PCR for cell-free DNA (cf-PCR) in plasma and egg DNA in stool.

Results: KK and POC CCA results were obtained from 1264 participants, 632 women and 632 men. We found 38/1264 (3.0%) positive results with KK and 193/1264 (15.2%) positive results with POC CCA. In addition, the CCA test yielded 40% “indeterminate” test results with weak positive bands. KK microscopy was less frequently positive in women (11/632, 1.74%) than in men (27/632, 4.27%). The POC CCA test was predominantly positive in women 110/632 (17.4%), compared to men 83/632 (13.1%). For confirmation 182 samples were selected for plasma cf-PCR. Among KK positive, only 9 of 29 cases (31.0%) were confirmed by cf-PCR. Of the KK negative 51 of 153 (33%) samples tested positive with plasma PCR. Stool samples of 27 participants with positive KK and 28 participants with negative KK underwent testing with stool PCR. Only 4 of 27 cases (14.8%) were confirmed by PCR. Of the KK negative 7 of 28 (25%) samples were found positive. The positive results of the POC-CCA test were confirmed by plasma cf-PCR in 67.5% of cases. The weak positive bands resulted in a positive rate of 14%.

Conclusion: Our study noticed unreliable results of the KK microscopy likely due to testing post storage, suspension of training and quality control. The POC CCA test gives an easy-to-use alternative.

KEYWORDS: Diagnostic tests; *Schistosoma mansoni* infections

PO-NTD-04

Prevalence of intestinal schistosomiasis infection among school children in sengerema, Tanzania

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Introduction: Infection with intestinal schistosomiasis remains a public health concern estimated 779 million people are at risk of catching the disease Globally and 3,000 get death annually in sub-saharan Africa. In Tanzania, approximately 51.5% of people are at risk of being infected with schistosomiasis, the prevalence of up to 80% infection has been reported in some regions of the country. The infection with intestinal schistosomiasis is highly endemic in areas surrounding lake victoria with school going age (5-15 years) children harbouring the highest level of infections. The program for control and elimination of schistosomiasis is based on annual Mass Drug Administration (MDA) with praziquantel among school schoolage children, with major focus on regions along lake victoria zone. However, there is limited information regarding the current status of the disease in Sengerema. This study was carried out to determine the prevalence of intestinal schistosomiasis among school children in Sengerema district and investigate the influence of swimming in the lake on infection with *S. mansoni* among school age children.

Methodology: A cross sectional study was carried out in two primary schools in Busisi ward at Sengerema district in April 2022. 260 school aged children were randomly selected; the demographic information for each participant was obtained by using structured questionnaires. Stool samples collected from 260 children using clean wider mouth plastic containers. The samples were processed using parasitological techniques and examined for the presence of *Schistosoma mansoni* eggs using formal ether concentration method. RESULTS The presence of *Schistosoma mansoni* infection was 7.69% and other parasitic infection was 36.9% including hook worm, *Trichuris trichiura*, *Giardia lamblia* and *Entamoeba histolytica*. Children aged 12-15 years (OR=0.03, 95%CI=0.19-0.46), P=0.001). Also participants who practice swimming were 0.135 times more likely to be infected with *Schistosoma mansoni* (OR=0.135, 95%CI=0.416-0.44).

Conclusion: The observed low prevalence of helminthes may have been attained by preventive chemotherapy.

Field Evaluation of a Real-time PCR Method (ND-5, O-150) for Detection of *Onchocerca volvulus* in *Simulium damnosum* Blackflies in Tanzania.

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Introduction: *Onchocerca volvulus* (OV) is the causative agent of river blindness (onchocerciasis), a significant public health concern in many tropical regions. *Simulium damnosum* blackflies are the primary vector, transmits the parasite through bites. Blackfly pool screening qPCR method targeting ND5 and O-150 genetic regions is simpler, faster and more cost effective than the current end points molecular assay, O-150 PCR-ELISA.

Objective: To evaluate the effectiveness of a real-time PCR method targeting the ND5 and O150 genetic regions for the detection of OV in *S. damnosum* populations in the Tukuyu focus, Tanzania.

Methods: A total of 3,726 *S. damnosum* blackflies were collected from various sites in the Tukuyu focus. DNA was extracted from the heads of the blackflies using a standard protocol suitable for insect tissue. Pools were subjected to real-time PCR (qPCR) targeting the ND5 and O150 regions to detect *O. volvulus*. Confirmatory qPCR testing and Illumina next-generation sequencing (NGS) analysis were conducted on 432 base-pair regions of the ND5 gene at the Centers for Disease Control and Prevention (CDC) to verify results.

Results: Real-time PCR test results were negative for ND5 and O150 targets for 31 of 42 pools. Ten pools were inconclusive due to aberrantly weak fluorescent signal observed with the OvND5 target. One sample was positive for O150 only. Next generation sequence (NGS) analysis results indicated that none of the ND5 sequences detected from the inconclusive samples were *O. volvulus*.

Conclusion: The combination of O150 and OvND5 targets increased specificity but revealed challenges in detecting *O. volvulus* due to cross-reactivity with other zoonotic species. Additional optimization of the OvND5 qPCR assay is necessary to improve its specificity and reliability for detecting OV in field samples.

KEYWORDS: *Onchocerca volvulus*; *Simulium damnosum*; Blackflies; Tanzania.

A Community-Based Study on Knowledge and Practices of Leprosy-Affected People in Morogoro and Tanga Regions

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Background: Leprosy also known as Hansen disease, is a chronic disease caused by a bacterium, *Mycobacterium leprae*. Lack of knowledge about leprosy, is among the obstacles to early case detection and treatment and therefore reduces the effectiveness of leprosy care and control activities. This study was conducted to assess community knowledge and practices of leprosy affected people living in districts of Morogoro and Tanga regions.

Methods: We conducted a mixed-methods approach using a cross-sectional design for quantitative data and a phenomenological design for qualitative inquiry. The study was conducted in two regions of Tanzania; Tanga and Morogoro from June to August 2024. Quantitative data were collected using structured questionnaires while qualitative data was obtained through key informant interviews and focus group discussions. The study

participants included people affected with leprosy, community members, and health care workers. Knowledge levels were assessed using 12 self-reported items and categorized as having good knowledge or poor knowledge upon having more than 75% of the correct answers.

Results: The average knowledge score of respondents was 3.32 (SD=1.14; range: 0-6). Slightly more than half of the study participants (55.3%) who responded to the questionnaire answered correctly the questions on leprosy treatment options, with majority (98.4%) identifying “pharmaceutical drugs” as the primary mode of treatment. However, a small proportion 28% of respondents acknowledged the existence of alternative treatment options. Knowledge scores varied significantly across participant’s level of income ($t=-3.543$, $p=0.001$) but showed no significant association with sex. Qualitative findings revealed persistent misconceptions and culturally rooted beliefs about leprosy attributed to supernatural causes such as witchcraft.

Conclusion: Study participants demonstrated limited knowledge on leprosy and inadequate healthcare seeking behaviors. Interventions are required to improve knowledge and practices of leprosy Affected People in the study areas.

KEYWORDS: Leprosy; Knowledge; Practices; Tanzania

P0-NTD-01

Isolation of *Histoplasma capsulatum*, the Causative Agent of Histoplasmosis in Humans: A Case Study in Mbeya, Tanzania

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Background: *Histoplasma* is a genus of dimorphic fungi commonly found in bird and bat droppings. *Histoplasma capsulatum*, the causative agent of histoplasmosis, occurs worldwide and should be considered in patients presenting with unexplained pulmonary or systemic illnesses. In Tanzania, *H. capsulatum* infections have been reported in coastal regions, particularly in Tanga and Dar es Salaam. Chronic histoplasmosis can clinically resemble tuberculosis following exposure.

Methodology: This case study was conducted at NIMR-MMRC. Bat droppings were collected in Falcon tubes and transported to the laboratory for processing. An inoculum was prepared by adding 0.5 ml of 0.85% NaCl and vortexing. A few drops of the suspension were inoculated onto two Sabouraud dextrose agar plates. One plate was incubated at room temperature for several days, while the other was incubated at 37°C for 24 hours. Fungal growth was examined both macroscopically and microscopically.

Results: At 37°C, cultures showed 2–3 mm wrinkled, moist, heaped, creamy yeast-like colonies. Gram staining revealed round to oval budding yeast cells. At room temperature, white, fluffy mold colonies were observed, which gradually turned brown to buff with age. Using the cellophane tape technique, mycelia with round microconidia were identified.

Conclusion: The findings confirmed the presence of *Histoplasma capsulatum*, the causative agent of histoplasmosis in humans. Chronic histoplasmosis may present with symptoms similar to those of *Mycobacterium tuberculosis*, which can lead to misdiagnosis. Preventive measures should be taken to minimize exposure to fungal spores, particularly in environments contaminated with bird or bat droppings.

KEYWORDS: *Histoplasma*; Bat droppings

P0-CD-02

Seroprevalence of multiple Arboviruses and *Aedes* mosquitoes from individuals living in Tanga and Unguja, Tanzania

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Background: Arboviruses transmitted by mosquitoes and other arthropods are an increasing public health concern globally. In Tanzania, infections caused by Chikungunya virus (CHIKV), Dengue virus (DENV), Zika virus (ZIKV), and other Orthoflaviviruses are increasingly recognized, yet their epidemiology remains poorly defined due to limited surveillance. Understanding exposure patterns is essential to guide prevention, surveillance, and vaccine strategies.

Methods: A cross-sectional serological survey was conducted among 2,682 participants from 11 villages in Tanga (n = 1,982) and four shehias in Unguja (n = 700). IgG responses to multiple arboviruses and to the Aedes mosquito salivary peptide (Nterm-34kDa) were measured using a Luminex-based multiplex immunoassay.

Results: Overall, 13% and 17% of samples showed IgG antibodies against Usutu virus (USUV) and West Nile virus (WNV), respectively, in both regions. In Tanga, arboviral seroprevalence varied markedly by elevation: upland villages such as Chogo and Mkata Mashariki recorded the highest prevalences (>70% for CHIKV and DENV, and 18.4% for the Aedes salivary antigen), whereas highland sites like Ubiri and Kinko showed the lowest (0.6% for YFV, 49% for CHIKV, and $\leq 3.2\%$ for Aedes salivary antigen). In Unguja, overall exposure was lower, but the urban site Malindi exhibited high seroprevalence (68.4% for DENV3, 64.6% for DENV4, 52.5% for ZIKV, 38% for WNV, and 27.8% for USUV). Semi-urban and rural sites had lower arboviral seroprevalence but higher Aedes salivary antigen prevalence (7.3–9.6%). Across both regions, seroprevalence was generally higher among individuals aged >5 years, with gender differences noted for CHIKV, USUV, WNV, and the Aedes salivary antigen.

Conclusion: This study demonstrates widespread exposure to multiple arboviruses in Tanga and Unguja, with clear spatial and demographic variation. Importantly, detection of USUV antibodies provides the first serological evidence of its circulation in Tanzania. These findings highlight ecological hotspots of transmission and underscore the need to strengthen vector control strategies beyond urban centers to reduce arboviral disease burden.

KEYWORDS: Arboviruses; Chikungunya; Dengue; Usutu; Zika; Aedes; West Nile; Mosquitoes

Non-Communicable Diseases, Injuries, Nutrition, Mental Health, and Co-morbidities

80 Abstract(s)

OR-CANC-01

Occupational Radiation Exposure and Cancer Risk Estimation for Medical Personnel Caring the I-131 Therapy Patients in Tanzania

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Background: The therapeutic administration of iodine-131 (I-131) for the treatment of thyroid cancer is a well-established nuclear medicine practice. However, in this process, patients become temporary sources of radiation because gamma photons are emitted during the decay of I-131. There is limited quantitative data on exposure to medical personnel attending patients treated with I-131.

Methods: Computational simulation study was conducted using the Particle and Heavy Ion Transport Code System (PHITS). Anthropomorphic phantoms representing patients and caregivers were used to model radiation transport for administered activities of 100 to 200 mCi. Model validation was performed by comparing simulated dose rates with experimental measurements obtained using a calibrated survey meter and a point source under identical geometrical conditions. Three caregiving scenarios, including dose monitoring, contamination management and corpse preparation, were simulated at distances ranging from 10 cm to 200 cm in intervals of 10 cm. The effective half-life of I-131 in patients was assumed to be 14 hours. Dose estimates were aggregated across simulated interaction scenarios, and sensitivity to distance and activity levels was evaluated.

Results: The estimated daily radiation dose to medical personnel ranged from 0.28 to 0.60 mSv, corresponding to the doses of 6.48 mSv, 10.04 mSv, and 13.60 mSv for administered activities of 100 mCi, 150 mCi, and 200 mCi, respectively. Under multiple patient caregiving conditions, cumulative annual doses could reach 29.65 mSv, exceeding the recommended occupational limit of 20 mSv/year. Dose estimates showed strong dependence on caregiver-patient distance and frequency of interaction. Preliminary risk assessment suggests relatively higher lifetime cancer risk for younger personnel; however, quantitative risk estimates require further validation.

Conclusion: This study demonstrates that occupational exposure among medical personnel attending I-131 therapy patients in Tanzania may approach or exceed recommended dose limits under certain conditions, highlight the importance of optimising time, distance, and staff rotation strategies.

KEYWORDS: : I-131 therapy; occupational radiation exposure; nuclear medicine; Monte Carlo simulation; PHITS; cancer risk assessment

OR-CANC-02

Male Breast Cancer in Northern Tanzania: Clinicopathology and Predictors of Two-Year Survival (2016-2022)

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Introduction: Male breast cancer (BC) is rare, accounting for approximately 1% of all BC worldwide. Patients often present with advanced disease, contributing to poor outcomes. This study aimed to estimate two-year overall survival (OS) and identify clinicopathological and health-system-related predictors of survival among men with BC treated at Kilimanjaro Christian Medical Center (KCMC).

Methodology: A retrospective cohort study was conducted involving 55 histologically confirmed male BC patients managed at KCMC between 2016 and 2022. The primary outcome was two-year OS defined as time from histological diagnosis to death from any cause or censoring at two years. Independent variables were clinical and pathological factors. Descriptive statistics summarized participants' characteristics. Kaplan-Meier curves, log-rank and Cox proportional hazards regression were used to estimate the OS and the factors associated.

Results: The mean age at diagnosis was 62.2 ± 14.3 years, with majority (54.55%) aged between 50–70 years. Over half (52.73%) presented with stage III or IV disease, and 21.82% had distant metastasis. Invasive ductal carcinoma was predominant histological sub type (63.64%). approximately 75% of patients tested for molecular sub-type, of these, luminal B was almost 43.33%. Surgery was performed in 60% of patients, chemotherapy given in 47.27%, hormonal therapy in 30.91%, and radiotherapy in only 9.09%. The overall two-year survival rate was 67.3%. Independent predictors of poor survival included age >70 years ($p=0.009$), stage IV disease ($p=0.005$), delayed receipt of histopathological results (> 2 weeks), delayed surgery (>6 weeks), and non-receipt of hormonal therapy or radiotherapy.

Conclusion: AND RECOMMENDATION: Male BC is a disease for elder who frequently present with advanced-stages. Two-year OS remains sub-optimal and is strongly influenced by advanced disease stage, older age, diagnostic and treatment delays, and limited access to adjuvant therapies. Strengthening early diagnosis, timely pathology reporting, and access to radiotherapy and hormonal therapy may substantially improve outcomes.

OR-CANC-04

Exploring the prevalence, pattern, and management outcome of paediatric haematological malignancies in the central zone of Tanzania at Benjamin Mkapa Hospital

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Introduction: Cancer in children presents a significant public health issue, with an estimated 400,000 children and adolescents aged between 0 to 18 years developing cancer each year globally. Haematological malignancies, leukaemia, and lymphomas are among the most common childhood cancers in Africa, and only lymphomas account for 10% of all malignancies diagnosed in the paediatric population. Furthermore, in low-income countries, only 10 - 20% of these cancers are cured. Data are scarce for the pattern and management outcome of paediatric haematological malignancies.

Methods: A hospital-based retrospective cross-sectional quantitative study was conducted at BMH from January 2020 to November 2025. The study included 196 children aged 0-17 years diagnosed with paediatric haematological malignancies at BMH. Data were collected from the oncology medical records at the hospital. Data were cleaned and analysed using IBM SPSS Statistics version 27. Approval from the University of Dodoma and BMH

Results: In the study, a total of 196 pediatric oncology cases were found from January 2020 to November 2025 at BMH. Among the cases, males were 106 (54.1%) and females were 90 (45.9%). The overall prevalence of hematological malignancies is 22.4% (44/196); leukemia 68.2%, lymphoma 31.8%. The overall pattern shows that

the most common cancer subtype was Acute Lymphoblastic Leukaemia (52.3%), followed by Non-Hodgkin Lymphoma (18.2%). At the time of diagnosis 54.8% (23) had late-stage. Among all, 63.6% were alive, and 36.4% died. These findings underscore that late-stage malignancy diagnosis ($X^2=5.999$, $p=0.014$) and hepatosplenomegaly ($X^2=6.623$, $p=0.010$) are key predictors of poor outcomes in paediatric haematological malignancies.

Conclusion: The study findings have shown the implications of late diagnosis on the outcome of the patients, which is associated with an increase in mortality rate for most patients. There is a need to strengthen the referral systems from the primary health care to specialized cancer centres for early intervention.

KEYWORDS: paediatric cancer; childhood cancer; paediatric malignancies; childhood malignancies; haematological malignancies; tanzania

OR - CANC - 06

Barriers to timely diagnosis of Chronic Myeloid Leukemia in the northern zone of Tanzania, healthcare workers' perspective

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Background: Chronic myeloid Leukemia (CML) is the leading leukemia in Tanzania and characterized by increased myeloid cells in the bone marrow and peripheral blood. The algorithm for detection of CML on primary health care (PHC) level is based on clinical presentation, full blood count (FBC) and peripheral smear (PBS) for cytomorphology. This study is focused on PHC personnels' perspective to highlight causes of delayed diagnosis influence initiation of treatment.

Methods: A qualitative analytic design for purposively sampled in-depth interviews (IDI) was chosen using an interview guide containing 11 open-ended questions. The questions explored knowledge around CML, ability to clinically suspect CML based on symptoms, laboratory parameters indicative of CML, ability to differentiate CML from other blood disorders, referral processes of patients, system and personnel perceived challenges and ways of mitigating them. Data were analyzed using thematic approach and NVivo12-software.

Results: 46 IDIs were conducted (clinicians (20), nurses (11), laboratory personnel (15)) revealing several factors influencing timely diagnosis and commencement of treatment: knowledge limitations, diagnostic capacities, human resource gaps and systemic challenges. Participants demonstrated partial understanding of CML, specifically its differentiation from other leukemias and pathophysiology. Participants underscored reliance on FBC and PBS for initial suspicion. Key indicators such as leukocytosis, anemia, and thrombocytosis were cited as important diagnostic clues. Knowledge gap among clinicians, including lack of hematologists, further contributes to delayed detection. While equipment was reported adequate in many settings, the broader system lacks human resources to translate diagnostic capacity into timely action. Referral pathways were mostly unclear, and clinicians demonstrated deficiency of awareness of a free-access-to-treatment-program in the country.

Conclusion: Knowledge deficit, scarcity of expertise, insufficient investments, and healthcare systems constraints were identified as key barriers. Participants suggested CML training through on-site trainings to PHC workers could impact early diagnosis and initiation of treatment.

KEYWORDS: CML; Delayed Diagnosis; Healthcare workers; primary health care

Rapid progression of gallbladder cancer from stage I to stage IV in 4 months: Radiological perspective and the critical need for timely intervention.

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Background: Gallbladder cancer (GBC) is the most common biliary tract malignancy, strongly associated with cholelithiasis. Early-stage disease has an excellent prognosis, while advanced disease carries high mortality. This case illustrates the radiological perspective and critical importance of timely intervention in gallbladder cancer management.

Methods: A clinical case of a 68-year-old male with gallbladder cancer, evaluated using ultrasound, non-enhanced and contrast-enhanced computed tomography (CT) of the abdomen at a regional referral hospital in Southern-Highlands, Tanzania. Imaging findings were correlated with disease progression over a 4-month period.

Results: The patient initially presented with vague abdominal pain. Initial ultrasound and CT-abdomen demonstrated a gallbladder tumor, confined to the gallbladder wall, suspicious of stage I gallbladder carcinoma (T1bN0M0 - TNM staging) with associated cholelithiasis and localized cholecystitis. Urgent referral to a tertiary hospital for histopathological confirmation and definitive surgical and oncological management was recommended. However, due to socioeconomic constraints, the patient could not pursue immediate referral. Four months later, the patient re-presented with worsening clinical status, including jaundice, cachexia, and systemic symptoms. Follow-up CT abdomen revealed an aggressive gallbladder tumor progression with direct invasion into adjacent liver segments and the duodenum, portal hypertension, extensive metastatic lymphadenopathy and vascular complications including inferior vena cava and iliac veins thrombosis. These findings were consistent with advanced stage IV disease (T3N2M0). The patient was managed palliatively and died on the tenth day of hospitalization.

Conclusion: AND RECOMMENDATIONSThis case demonstrates the aggressive nature and rapid progression of gallbladder cancer, which can evolve from potentially curable stage I to terminal stage IV disease within a short period when treatment is delayed. It underscores the urgent need to improve access to early diagnosis, facilitate timely and subsidized referrals, strengthen specialized imaging, pathology and oncology services at regional levels, and enhance multidisciplinary care coordination to improve outcomes in aggressive malignancies.

KEYWORDS: Gallbladder; Cancer; Cholelithiasis; Ultrasound; Computed-Tomography

Genotypes of Human Papillomavirus and clinical pathological features among patients with Anal Carcinoma in North-western Tanzania

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Background: Anal carcinoma is an increasingly important public health problem, mainly caused by high-risk human papillomavirus (HPV) infection. However, data on HPV genotype distribution and associated clinicopathological features among patients in Tanzania remain limited. This study aimed to describe HPV genotypes and their relationship with clinical and pathological characteristics in patients with anal carcinoma in Northwestern Tanzania.

Methods: This longitudinal, analytical, laboratory-based study was conducted at Bugando Medical Centre between 30 April 2023 and 02 January 2025. A total of 68 formalin-fixed paraffin-embedded (FFPE) tissue blocks from histologically confirmed anal carcinoma cases were analysed. DNA was extracted, and high-risk HPV genotyping was performed using the Anyplex™ II HPV28 PCR assay. Data were analysed using Stata version 15, with statistical significance set at $p < 0.05$.

Results: High-risk HPV DNA was detected in 41/68 cases (60.3%). Among HPV-positive patients, 68.3% were female and 31.7% male. HPV16 was the most common genotype (45.8%), followed by HPV18 (16.3%) and HPV33 (6.8%). Multiple HPV infections occurred in 26.5% of cases. HPV-negative anal carcinoma was significantly associated with tumour involvement of both the anal canal and surgical margins, advanced T stage (III–IV), lymph node involvement, distant metastasis, and tumour size >2 cm (all $p < 0.001$). Keratinising squamous cell carcinoma was the predominant histological subtype (45.6%), and 48.5% of patients were HIV-positive.

Conclusion: High-risk HPV infection, particularly HPV16 and HPV18, is common in anal carcinoma in Northwestern Tanzania and is associated with key clinicopathological features. Strengthening HPV vaccination for both sexes, alongside expanded screening and public awareness, is essential to reduce the burden of anal carcinoma and other HPV-related cancers.

KEYWORDS: Human papillomavirus; Anal carcinoma; Genotype distribution; Clinicopathological factors.

OR-CLIM-04

Prevalence and severity of hypertension in drought-affected districts: A cross-sectional analysis in Tanzania

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Background: Climate change-driven droughts are increasingly recognized as threats to human health, including cardiovascular outcomes. Tanzania is highly vulnerable to recurrent drought and is experiencing a rising burden of hypertension, yet the relationship between drought exposure and blood pressure remains unclear.

Objectives: To assess the association between drought exposure and hypertension prevalence and severity among Tanzanian adults, accounting for demographic, socioeconomic, and lifestyle factors.

Methods: We conducted an analytical cross-sectional study in eight Tanzanian districts categorised by drought exposure using the standardised precipitation index (SPI) from 1970 to 2023. A total of 2,842 adults aged ≥ 18 years were included. Blood pressure was measured on two consecutive days using validated devices. Hypertension was defined as systolic blood pressure (SBP) ≥ 140 mmHg and/or diastolic blood pressure (DBP) ≥ 90 mmHg and categorised as normal, elevated, stage 1, and stage 2 hypertension. Associations were assessed using multivariable Poisson, linear, and multinomial regression models adjusting for key covariates.

Results: Hypertension prevalence was similar between drought-exposed and non-exposed populations (25.2% vs 26.4%; PR = 0.95, $p = 0.483$). However, drought exposure was associated with lower SBP (-1.86 mmHg, 95% CI: -3.50 to -0.23 ; $p = 0.0026$), with no difference in DBP. In adjusted analyses, drought exposure correlated with diminished hypertension prevalence (PR = 0.89, 95% CI: 0.79–0.99; $p = 0.038$) and reduced SBP ($\beta = -3.25$ mmHg, 95% CI: -4.70 to -1.80 ; $p < 0.001$). Severity analyses showed a non-linear pattern: moderate drought was associated with lower odds of elevated blood pressure and stage 2 hypertension, while severe drought was associated with increased SBP, DBP, and stage 1 hypertension. Age and BMI were the strongest predictors.

Conclusion: Drought exposure shows a non-linear association with blood pressure, with potential adaptive effects at moderate levels and increased risk at higher severity

KEYWORDS: Key words: Climate change; non communicable diseases; Hypertension; Drought exposure; SPI

OR - CVD - 01

School-based blood pressure measurement and its association with left ventricular mass index among adolescents in urban Tanzania

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Background: High blood pressure (BP) among adolescents is becoming common, especially in sub-Saharan Africa. However, there is limited data on its association with left ventricular hypertrophy, a known predictor of future cardiovascular diseases (CVDs). We aimed to determine the association between school-based BP measurement and left ventricular mass index (LVMI) among 210 school-attending adolescents in Mwanza City, in northwestern Tanzania.

Methods: BP measurements were obtained at two visits approximately 1 week apart using standard procedures. Participants were defined as having high BP if they had elevated BP or hypertension as per the standard guideline. Transthoracic echocardiography was performed by a single female sonographer using the Sonosite M-Turbo ultrasound system. Questionnaire data were collected by a trained research assistant using a structured Swahili-translated WHO STEPS tool.

Results: Of all participants, 39 (18.6%) had high BP at only one of the two visits, and 25(11.9%) had high BP at both visits (sustained high BP). Overall, after adjusting for potential confounders, having sustained high BP was associated with an increase in LVMI, 6.4 (95% CI, 1.4 to 11.4) g/m². Also, having high BP at only one of the two visits was associated with an increase in LVMI, 4.5 (95% CI, 0.4 to 8.6) g/m². Additionally, daily consumption of 6 or more teaspoons of sugar was associated with higher LVMI, 5.4 (95%CI, 0.1 to 10.7) g/m². In contrast, daily consumption of at least 5 servings of fruits and vegetables was associated with lower LVMI, -3.7 (95% CI, -7.2 to -0.1) g/m². Conclusion

Conclusion: school-based BP measurement in urban Tanzania is associated with significant differences in LVMI. Promoting healthy lifestyles, such as adequate consumption of fruits and vegetables and limiting sugar consumption, could help to improve cardiovascular health during adolescence.

KEYWORDS: High BP Left Ventricular Mass Index; Adolescents; Tanzania; sub-Saharan Africa

OR - CVD - 02

Prevalence of major cardiovascular diseases in Tanzania: A systematic review and meta-analysis

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Background: Cardiovascular diseases (CVDs) are a leading cause of morbidity and mortality globally, with an increasing burden in low- and middle-income countries, including Tanzania. Despite growing evidence of CVDs in

the country, comprehensive estimates of their prevalence remain limited.

Methods: This systematic review and meta-analysis synthesized available evidence from studies conducted in Tanzania between 1990 and March 2025 to estimate the pooled prevalence of major cardiovascular diseases and provide an updated understanding of the national burden.

Results: A total of 11 eligible studies with 32 696 participants were included in this review. The prevalence of major cardiovascular diseases ranged from 2% to 41%, with a pooled prevalence of 11 % (95% CI: 6-20). Prevalence was higher in hospital-based settings (15 %; 95% CI: 8-25) than in school settings (3%; 95% CI: 2-4%). A subgroup analysis by CVD subtypes showed hypertensive heart disease as the most prevalent CVD (41%; 95% CI: 38-45), followed by acute myocardial infarction (22%; 95% CI: 19-26), and coronary artery disease (21 %; 95% CI: 17-26). The least prevalent condition was rheumatic heart disease, with a pooled prevalence of 3% (95% CI: 2-3).

Conclusion: The prevalence of cardiovascular diseases is high in Tanzania. Patients attending healthcare facilities exhibited a higher burden of CVD than school children, highlighting the need for targeted prevention, early detection, and management strategies for cardiovascular conditions.

KEYWORDS: Cardiovascular diseases; Prevalence; Systematic review; Meta-analysis; Tanzania

OR - CVD - 03

Applying the ADAPT-ITT Model to Engage Religious Leaders in Cardiovascular Health Promotion in Rural Communities in Northwestern Tanzania

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Background: High blood pressure (BP) is a major public health concern in Tanzania but its awareness and treatment remain low. Our previous studies have identified several barriers to BP control including low perceived need for screening, low trust in biomedical health care, prioritization of spiritual health over physical health, and unhealthy norms about diet and physical activity. Leveraging religious leaders (RLs) as trusted community members, this study aimed at engaging RLs in cardiovascular health education and hypertension screening through a seminar integrating health messages with religious teachings.

Methods: We adapted our previous religious engagement in health intervention using the ADAPT-ITT model to develop an educational intervention aiming to educate and empower RLs so that they can engage their communities in cardiovascular health promotion. The intervention integrated health messaging with religious teachings to improve screening uptake and facilitate linkage to hypertension care. Fifty-one RLs and community leaders participated in two theater test seminars, which informed iterative refinement of the intervention. We used Lee and Koh empowerment framework to examine how self-determination, competence, meaningfulness, and impact influenced RLs' motivation to act as active agents of change in scaling and sustaining community-based health interventions. Result: RLs demonstrated increased confidence in delivering hypertension education and integrating health promotion with religious teachings. The intervention enhanced RLs' knowledge and skills, strengthening their ability to screen for hypertension and counsel community members. Participants emphasized the acceptability and feasibility of faith-based health interventions, highlighting the role of RLs as credible health advocates.

Conclusion: Strategies to empower RLs for health promotion through the integration of faith-based education into health interventions fosters trust, cultural relevance, and sustainability. This approach shows strong potential to improve hypertension awareness, early detection, and health-seeking behaviours. Strengthening RLs-led

health initiatives through training and capacity-building can improve community engagement and long-term public health outcomes.

KEYWORDS: blood pressure; hypertension; cardiovascular health; religious leaders

OR-CVD-04

Investigating Nanoemulsified Policosanol-Simvastatin Combinations for Cardiovascular Disease Prevention using *Drosophila* Model

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Background: Cardiovascular diseases (CVDs) remain the leading cause of global mortality, with dyslipidemia serving as a primary risk factor. While statins remains the gold standard for the treatment, concerns regarding side effects and suboptimal efficacy in some patients necessitate the exploration of novel, low-cost combination therapies with improved delivery systems.

Objective: This study evaluated the physicochemical properties and therapeutic efficacy of nanoemulsified Simvastatin (SIM), Policosanol (POL), and their combinations using a *Drosophila melanogaster* model of metabolic dysfunction.

Methods: Nanoemulsions were synthesized using high- and low-energy methods. Metabolic dysfunction was induced in *Drosophila* using a high-fat, high-sugar (HFHS) diet for seven days, followed by seven days of treatment with nanoemulsified SIM, POL, or combinations (T1-T9). Efficacy was assessed via biochemical assays for glucose, glycogen, trehalose, cholesterol, and triglycerides (TGs), and RT-PCR analysis of metabolic genes (BMM, ILP2, AKH, and FOXO). Conbenefit software was used to evaluate for combination results.

Results: Nanoemulsions were stable with particle sizes <200 nm (29.86 nm to 121.9 nm) and Polydispersity Index (PDI) values between 0.283 and 0.463. In both sexes, treatments significantly ($p < 0.001$) reversed HFHS-induced hyperglycemia and hyperlipidemia. In males, low-dose combinations (T7) showed strong synergy in glucose reduction, while females showed moderate synergy in TG reduction. Gene expression analysis revealed a massive upregulation of AKH and FOXO (e.g., in T8), alongside significant upregulation of the lipase gene BMM (T5 and T8), indicating a shift toward energy mobilization and lipolysis. Specifically, T6 and T7 significantly upregulated ILP2 in females, correlating with reduced TGs. However, sex-dependent antagonism was noted in female glucose control.

Conclusion: Nanoemulsified POL-SIM combinations effectively modulate lipid and carbohydrate metabolism by regulating the Insulin/IGF-1 Signaling (IIS) pathway. These findings suggest that these nanoformulations offer a promising, sex-specific approach for CVD prevention and metabolic syndrome management.

KEYWORDS: *Drosophila melanogaster*; obesity; insulin resistance; gene expression; nanoemulsion; policosanol; simvastatin.

OR-DIG-08

Digital health scale-up: A Pilot Offline Digital System for Diabetes and Hypertension Management in Rural Tanzania

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AFFILIATIONS

1. Remote Care Research Organization

Background: Diabetes mellitus and hypertension are leading non-communicable diseases (NCDs) in Tanzania. A previous study in Rombo, Kilimanjaro among 525 participants found hypertension prevalence of 52.6% and diabetes prevalence of 4.6%, both higher among females, older age groups, and those with BMI >25. A third of hypertensive participants were aware of their diagnosis yet not on medication, and 42% of diabetic participants had never been on treatment. Despite this burden, most facilities rely on paper records, hindering client tracking and allowing missed visits to go unnoticed. This study describes the development and evaluation of a digital solution to address these gaps.

Methods: RemoteCare is an offline-capable, web-based clinical tool for documenting consultations, diagnoses, prescriptions, investigation findings, and review dates to support longitudinal client follow-up. Clinical assessments follow ICD-10 coding, WHO and Tanzania standard treatment guidelines (STGs). During NCD sessions, CHWs record client measurements before clinical review. Clinicians input encounter details while maintaining routine notes, and the study team can remotely monitor service patterns without disrupting facility operations.

Results: The system has been tested and reliably functions offline, maintaining client records and identifying missed follow-up appointments. A pilot in selected facilities is being finalized. During implementation, data will be collected on client enrollment, follow-up rates, blood pressure and glycemic control, and staff user experience.

Conclusion: Effective NCD care requires reliable information systems that track clients across visits, flag those lost to follow-up, and assess disease control. This pilot evaluates the feasibility of such a system in a resource-limited, low-connectivity setting, with the aim of integrating a longitudinal NCD record scalable through GOTHOMIS.

KEYWORDS: Keywords: NCD; Hypertension; Diabetes mellitus; Community health workers; GOTHOMIS

OR-DM-02

Circulating inflammatory markers among people with diabetes in Tanzania; association with disease characteristics and dyslipidemia

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Background: Chronic inflammation and metabolic dysregulation may aggravate diabetes complications but this has hardly been studied in Africa, a region which is witnessing the most rapid growth of diabetes globally.

Methods: We measured 92 circulating inflammatory proteins and 350 metabolites in 243 adults treated for type 2 diabetes in Tanzania, comparing proteomics with 323 non-diabetic individuals from the same setting. Circulating inflammatory markers and metabolites were correlated with clinical characteristics, and inflammatory endotypes were defined using K means hierarchical clustering.

Results: 243 Adults with diabetes (68% female, median age 58 (53;66)) had variable levels of obesity (median BMI 28.1kg/m², median visceral fat (10%) and many reported visual loss (49%) and symptoms suggesting peripheral neuropathy (70%). Dysglycemia was common (median HbA1c 10%), with 15% using insulin and 82% metformin. Adjusted for sex, age and BMI, 23 of 75 inflammatory proteins showed significantly higher concentrations in people with diabetes compared to controls (False Discovery Rate [JC4] < 0.05), with 11/23 in chemokine signaling. Among people with diabetes, inflammation was associated with dysglycemia, obesity, diabetes duration, and increased creatinine and uric acid levels. Unsupervised hierarchical clustering revealed distinct inflammatory profiles among individuals with diabetes. Correlation analysis showed that among individuals with diabetes, the more inflammatory endotype was characterized by elevated pro-atherogenic lipids (LDL, VLDL, Apo B and Apo B/Apo A1) and associated with higher creatinine, beta-hydroxybutyrate, lactate and Acetone.

Conclusion: In this East-African population, diabetes is characterized by variable levels of inflammation, which likely contribute to disease severity and cardiovascular and other complications, and which may be a target for preventive strategies.

KEYWORDS: Diabetes; Proteomics; Metabolomics; Pro-atherogenicity; dyslipidaemia; Tanzania.

OR-DM-03

Quality of In-Use Insulin under Real-World Storage Conditions in Mwanza, Tanzania

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Background: Stability of insulin varies on storage conditions, handling and types of formulations, and in Tanzania, unreliable refrigeration and climate fluctuations can compromise storage, which can reduce potency. Real-world data is crucial for optimizing diabetes management in developing countries. Previous studies have reported mixed findings, linking insulin degradation to temperature fluctuations, formulation issues, and distribution challenges. This study assessed the impact of storage conditions on insulin content during usage among diabetic patients at Bugando Medical Centre (BMC).

Methods: This cross-sectional study, conducted from April to July 2024 in Mwanza, assessed the quality of 16 batches of insulin using the HPLC method. Insulin samples were collected from 48 diabetic patients attending the diabetic clinic at BMC and analyzed for physical appearance, identity, and concentration, while storage conditions were monitored using a Bluetooth temperature data logger.

Results: Of the 16 insulin batches analyzed, 7 (43.8%) had low active insulin content, while 4 batches (25%) contained no active insulin at all. Among the 48 patients sampled, 24 (50%) were using substandard insulin. Of the 26 patients who used two separate vials, 15 had at least one vial that failed to meet standard specifications. Among the 20 patients using a single combined vial, 7 (35%) had low insulin content.

Conclusion: All patients stored insulin within the recommended temperature range, yet several batches were substandard, showing variability and inadequate concentration. This suggests that factors beyond household storage, possibly related to formulation or manufacturing, may affect insulin quality and potentially compromise glycemic control.

KEYWORDS: Cold chain management; High performance liquid chromatograph (HPLC); in-use insulin stability; and Substandard insulin

Nutritional status and intestinal inflammation association with incretin hormones and insulin secretion among adults in Tanzania, Zambia and Philippines

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Background: Poor gut health may increase the risk of diabetes but data are limited. We assessed the role of intestinal inflammation and nutritional status on incretin hormones and insulin secretion.

Methods: This was a cross-sectional study using data from adults in Tanzania, Zambia and Philippines. Demography, HIV, body mass index, and fecal myeloperoxidase (MPO) and lactulose-rhamnose ratio (LRR) were collected as predictors. Intestinal inflammation was MPO ≥ 2 $\mu\text{g/ml}$ while LRR > 0.05 indicated increased intestinal permeability. Glucose-dependent insulintropic polypeptide (GIP), Glucagon Like Peptide-1 (GLP-1) and insulin were outcomes collected at fasting, 30 min, and 120 min during oral glucose tolerance test. Area Under the Curve (AUC) was calculated for each exposure group using the trapezoidal rule based on model-predicted marginal means at 0, 30, and 120 min and differences between groups estimated with 95% CI.

Results: 245 participants were analysed. Of these, 121 (49%) were females, 48(19.8%) were undernourished, 50 (20.7%) overweight, and 120(49.6%) HIV-infected. After adjustment for age, sex, HIV and diabetes, underweight and overweight had higher GIP AUC compared to normal weight participants ((4077 vs 3392, $p=0.01$) and (3717 vs 3392, $p=0.01$)), whereas normal weight had higher insulin AUC compared to underweight (6288 vs 5141, $p=0.001$), but lower insulin AUC compared to overweight participants (6288 vs 9133, $p=0.001$). Participants with intestinal inflammation had lower GIP AUC (4674 vs 6004, $p=0.02$), marginally higher GLP-1 AUC (1715 vs 1461, $p=0.05$) but no difference in insulin. Participants with elevated intestinal permeability had lower GIP AUC (4252 vs 6133, $p=0.001$), higher GLP-1 AUC (2415 vs 1744, $p=0.02$) and lower insulin AUC (4131 vs 4576, $p=0.01$).

Conclusion: Increased intestinal permeability is associated with lower GIP and reduced insulin secretion and could increase the risk of diabetes. Further studies should confirm these results in order to develop interventions to combat diabetes in poor settings.

KEYWORDS: Body mass index; intestinal permeability; GIP; GLP-1; insulin

Undiagnosed Diabetes among people living with HIV: a large cohort in Tanzania

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Background: Diabetes is rising sharply in sub-Saharan Africa (SSA) and poses a threat to people living with HIV (PLHIV). Systematic routine diabetes screening is uncommon, so the burden of undiagnosed diabetes is unknown. This study aimed to assess diabetes prevalence in PLHIV in Dar es Salaam using fasting blood glucose (FBG), oral glucose tolerance test (OGTT), and HbA1c.

Methods: The study conducted in five large hospitals serving a largely urban population in Dar es Salaam, Tanzania. A total of 10,574 PLHIV were assessed for eligibility, of whom 8,923 agreed to join the study and were invited to return fasted, and 5,617 returned for fasting glucose testing. Participants were adults on antiretroviral therapy and clinically stable. Procedures included FBG after 8-hour fasting, 2-hour OGTT following a 75g glucose

load, and HbA1c point-of-care testing.

Results: Of the 5,617 participants tested, 74.7% (4,203) were female. Mean (SD) ages were 47.0 (9.0) and 51.2 (10.2) years for females and males, respectively. A higher proportion of women than men were obese (31.0% [1303/4203] vs. 9.6% [136/1414]). Overall, 28.8% (1,580/5,490) of participants had diabetes based on at least one test. Among women, 12.7% (534/4203) and among men, 13.8% (195/1414) had fasting blood glucose ≥ 7.0 mmol/L. Following OGTT, 3.6% (148/4157) of women and 5.5% (77/1395) of men had blood glucose ≥ 11.1 mmol/L. Using HbA1c, 12.1% (508/4148) of women and 8.4% (118/1414) of men, with 11.1% overall, had HbA1c $\geq 6.5\%$. Among 5,490 participants who completed all three tests, 2% (110/5490) met diagnostic thresholds on all tests, while 4.5% (245/5490) met criteria on at least two tests, indicating poor agreement between diagnostic tools.

Conclusion: High levels of undiagnosed diabetes were found among stable PLHIV, and poor agreement across diagnostic tools challenges screening consistency. These findings support urgent integration of diabetes screening into routine HIV care.

KEYWORDS: HIV; Undiagnosed diabetes; Diabetes prevalence; Screening; Tanzania

OR-EPLPSY-01

Burden and Risk Factors of Epilepsy in Mainland Tanzania: Evidence from the District Health Information System (DHIS2)

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Background: Data on the burden and risk factors of epilepsy in Tanzania remain limited. Routine District Health Information System (DHIS2) data were used to assess geographic variation in epilepsy burden, identify associated risk factors, and explore patterns of service utilisation.

Methods: Monthly DHIS2 data from 184 district councils across 25 regions in mainland Tanzania from 2019 to 2023 were analysed. Proxy indicators for epilepsy risk included eclampsia, birth asphyxia, home delivery and severe malaria. Epilepsy burden was defined as the 75th percentile of monthly epilepsy cases, standardised by mid-year population. Explanatory variables were summarised using median monthly counts. Districts were categorised by onchocerciasis endemicity. Linear regression models were fitted using log-transformed epilepsy burden and explanatory variables, with statistical significance set at $p < 0.05$.

Results: The median number of epilepsy cases was 17,997 (IQR: 15,667–19,484) per month, with the highest burden observed in 2019 (19,403) and the lowest in 2022 (13,767). Regions with the highest epilepsy burden included Ruvuma, Morogoro, Dodoma, and Njombe, while Katavi and Simiyu had the lowest. High-burden districts included Ulanga, Madaba and Chamwino. Districts within onchocerciasis-endemic areas were associated with higher epilepsy burden (coef = 0.80, 95%CI: 0.51–1.01, $p < 0.001$). Birth asphyxia (coef = 0.20, 95%CI: 0.07–0.34, $p = 0.002$) and eclampsia (coef = 0.25, 95%CI: 0.10–0.41, $p = 0.002$) were also significant predictors. In Ulanga district, a community-based survey estimated an epilepsy prevalence of 21.2 per 1,000 population, compared with 3.3 per 1,000 based on DHIS2 data, indicating substantial under-ascertainment in routine data and potential gaps in access to care.

Conclusion: Epilepsy burden varies substantially across mainland Tanzania and is higher in onchocerciasis-endemic areas and districts with greater maternal and perinatal complications. The discrepancy between

community-based and routine data highlights under-detection and potential gaps in care. Strengthening surveillance systems and targeted interventions in high-burden areas are essential to reduce epilepsy burden.

KEYWORDS: Epilepsy; Burden; Risk factors; Tanzania

OR-HIV-12

Adiposity and blood pressure trends and associations in people living with HIV on dolutegravir-based ART and other ART in Mwanza, Tanzania: Analysis of a comparative cohort

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Background: High blood pressure (BP) is a serious public health concern in sub-Saharan Africa, including Tanzania, due to its role in cardiovascular diseases. Among people living with HIV (PLWH), weight gain has been associated with certain antiretroviral therapy (ART) regimens. Dolutegravir (DTG) is a newer ART regimen, but clinical and epidemiological studies suggest it may lead to weight gain, potentially increasing the risk of high blood pressure and cardiovascular complications. Study assessed the relationship between DTG, adiposity, and blood pressure among PLWH adults in Mwanza, Tanzania. The objectives were to determine the trends in blood pressure over three years between DTG and other ART regimens, to examine trends in adiposity measured by body mass index (BMI) and waist-to-height ratio (WHtR), and to evaluate the association between adiposity and blood pressure by DTG status.

Methods: A retrospective cohort design was applied using data from 500 adults' patients on DTG or other ART regimens between June 2016 and May 2021. Descriptive analyses used line graphs to illustrate trends in BP, BMI, and WHtR, while mixed-effects models were employed to assess associations adjusting for confounders.

Results: After adjusting for age and sex, DTG use was associated with a significant additional monthly increase in BMI (coefficient = 0.03, $p = 0.001$, 95% CI: 0.02–0.04), but its association with WHtR showed a non-significant reduction (coefficient = -0.008, $p = 0.359$, 95% CI: -0.03 to 0.009). After adjusting for the increase in BMI there was no significant change in systolic BP comparing DTG with other ART regimes (coefficient = 0.003, $p = 0.886$, 95% CI: -0.04 to 0.05). Conclusion, DTG was associated with greater increases in BMI compared to other ART regimens but after adjusting for BMI was not independently linked to higher systolic blood pressure. The observed systolic BP increase among DTG users was likely mediated through increased adiposity.

OR-HIV-13

Trend, regional variations, and factors associated with cervical cancer screening uptake among women living with HIV in Tanzania from 2014 to 2024

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Background: Cervical cancer remains the leading cause of cancer-related deaths among women in Tanzania, despite being largely preventable through early detection and treatment. Women living with HIV (WLHIV) are particularly vulnerable, yet national evidence on trends, regional disparities, and determinants of screening

uptake remains limited.

Objective: To determine the trend, regional variations, and factors associated with cervical cancer screening uptake among WLHIV in Tanzania from 2014 to 2024.

Methods: A retrospective open cohort study design was used, utilising secondary data from the national Care and Treatment Clinic 2 (CTC2) database. WLHIV aged 25 years and above on Antiretroviral therapy were included. Descriptive statistics summarised sociodemographic and clinical characteristics. Modified Poisson regression with robust standard errors estimated adjusted risk ratios (ARRs) and 95% confidence intervals.

Results: Of 1,461,253 WLHIV included, only 23% were screened. Screening uptake showed a slow increase from 0% in 2014, peaking at 27% in 2021, before declining to 1% in 2024. Regional disparities were notable, with coverage ranging from 5% in Geita to nearly 39% in Kagera. Older age (ARR: 1.85; 95% CI: 1.82 – 1.87), longer duration on HIV treatment (ARR: 1.51; 95% CI: 1.50 – 1.52), more frequent clinic visits (ARR: 4.06; 95% CI: 3.41 – 4.84), unstable client status (ARR: 2.69; 95% CI: 2.63 – 2.74), attending public facilities (ARR: 1.02; 95% CI: 1.01–1.02) and advanced WHO stage (ARR: 1.20; 95% CI: 1.19 – 1.22) were associated with higher screening uptake. Poor ARV adherence (ARR: 0.90; 95% CI: 0.88–0.93) and high viral load counts (ARR: 0.87; 95% CI: 0.85 – 0.88) were associated with lower screening rates.

Conclusion: Cervical cancer screening uptake among WLHIV in Tanzania remains suboptimal. There is a need to improve screening efforts towards underperforming regions, newly diagnosed, younger women, women with unsuppressed viral load count and poor adherence to treatment.

KEYWORDS: Cervical cancer; cervical cancer screening; WLHIV

OR-HIV-14

Prevalence of Neurocognitive Disorders Among HIV Patients Attending Mwananyamala Care and Treatment Clinic in Dar ES Salaams

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Background: HIV continues to be one of the public health challenges as of the 21st century ,and sub Saharan Africa accounts for up to ⅓ of the global burden of HIVAnd ARTs have transformed the course of HIV infection from an acutely fatal illness to a manageable chronic condition. However new clinical challenges arise, particularly the HIV-associated non-communicable comorbidities, among which neurocognitive disorders (NCDs) are increasingly prominent Facility-level data on HIV Associated NCDs from urban Tanzanian outpatient settings are scarceThis study determined the prevalence and biopsychosocial correlates of neurocognitive impairment among PLHIV at Mwananyamala Care and Treatment Clinic (CTC).

Objective: To assess the prevalence and biopsychosocial determinants of neurocognitive disorders among HIV patients attending the CT clinic in Dar es Salaam.

Methods: A ccross sectiona study design was conducted at Mwananyamala Regional Referral Hospital, located in Kinondoni District from October to November. A total of 426 participants were selected using:random sampling method. Structured questionnaire was used to collect data. Clinical files were reviewed, and geriatric depression scale was used to examine mental status. Association between HIV and mental health were tested using Chi square statistics and odd ratio.

Results: The prevalence of neurocognitive impairment was 22.3%, the most affected being people with low level of education (36.6%) and those who lived with HIV for 10 years (32.0%). Current count and viral load were not significant predictors of cognitive status.

Conclusion: The findings highlight a "Legacy Effect," where long-term chronicity of HIV drives neurological damage regardless of current immune recovery. Integrated mental health screening and socioeconomic support must be prioritized alongside virologic monitoring to manage the rising burden of neurocognitive co-morbidities in

the HIV populations.

KEYWORDS: HIV; Mental health; PLHIV; Care and Treatment Clinic.

OR-HTN-01

Prevalence of hypertension in Tanzania: a systematic review and meta-analysis

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Background: Hypertension is a leading modifiable risk factor for cardiovascular and chronic kidney diseases and an increasing public health concern globally and in sub-Saharan Africa, including Tanzania. In Tanzania, prevalence estimates vary widely across studies due to differences in populations and settings. Despite the growing number of evidence, nationally synthesized estimates remain limited, constraining understanding of the true burden, informed policy and intervention planning.

Objective: To estimate the pooled prevalence of hypertension in Tanzania, examine variations across study characteristics, and assess temporal trends.

Methods: A systematic search of PubMed and Google Scholar without restriction on publication year was conducted to identify studies reporting prevalence of hypertension in Tanzania. Studies were screened, with data extracted and quality assessed by independent reviewers. A random-effects generalized linear mixed model with binomial distribution and logit link was used to estimate pooled prevalence. Heterogeneity was assessed, and subgroup and sensitivity analyses conducted.

Results: Fifty-three studies involving 97,747 participants were included. The pooled prevalence of hypertension was 26% (95% CI: 21-31). Prevalence increased from 25.29% (95% CI: 9.78-51.38) in studies conducted in or before 2010 to 32.01% (95% CI: 25.24-39.63) in studies conducted in or after 2021, although this trend was not statistically significant ($p=0.171$). Higher prevalence was observed in community (29.30%; 95% CI: 23.55-35.8) and hospital settings (28.04%; 95% CI: 21.32-35.91). Regionally, the Central zone had the highest prevalence (49.7%; 95% CI: 42.47-56.94), while the Lake zone had the lowest (23.13%; 95% CI: 14.26-35.25).

Conclusion: Hypertension affects one-quarter of the Tanzanian population, with an increasing, though non-significant, trend over time. Strengthened strategies for early detection, treatment, and population-level prevention are urgently needed.

KEYWORDS: Hypertension; Prevalence; Systematic review; Meta-analysis; Tanzania

OR-HTN-02

Prevalence and determinants of hypertension among people living with HIV on antiretroviral therapy: a cross-sectional study at Mwananyamala Hospital, Tanzania

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Background: Hypertension is an increasingly recognized comorbidity among people living with HIV (PLHIV) receiving antiretroviral therapy (ART), contributing substantially to cardiovascular morbidity. As life expectancy among PLHIV improves, understanding both traditional and HIV-related determinants of hypertension is essential.

This study assessed the prevalence, associated factors, and hypertension knowledge among PLHIV on ART in Tanzania.

Methods: A hospital-based cross-sectional study was conducted among 296 PLHIV on ART for more than six months at Mwananyamala Regional Referral Hospital. Data were collected using structured questionnaires and clinical records. Blood pressure was measured according to American Heart Association guidelines. Logistic regression analyses were performed to identify factors independently associated with hypertension at $p < 0.05$.

Results: The prevalence of hypertension was 32.8%. Knowledge of hypertension was moderate (mean = 53.9%), with only 10.8% correctly identifying normal blood pressure levels. Age ≥ 55 years (aOR = 4.786, $p < 0.001$) and cigarette smoking (aOR = 6.159, $p = 0.020$) were associated with greater risk of hypertension. Long duration since HIV diagnosis (> 10 years: aOR = 3.090, $p = 0.011$) was also associated with increased odds of hypertension, whereas shorter ART duration (< 5 years: aOR = 0.106, $p = 0.040$) was associated with lower risk.

Conclusion: Hypertension is prevalent among PLHIV on ART in Tanzania, influenced by both traditional and HIV-related factors. Integrating hypertension screening and education within HIV care services is essential. Strengthening community engagement in chronic disease screening can enhance early detection, improve awareness, and promote preventive behaviours, ultimately reducing the dual burden of HIV and non-communicable diseases.

KEYWORDS: HIV; Hypertension; Antiretroviral therapy; Tanzania

OR-HTN-03

Hypertension Surveillance in Rural Tanzania: Leveraging Data from a Malaria Epidemiology Study in Bagamoyo District

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Background: Hypertension is a leading cause of global mortality but often remains undetected until complications arise. Globally, 1.28 billion adults are affected, with highest prevalence of 27% in Africa. In Tanzania, while national prevalence for younger adults is roughly 11%, many cases in rural areas remain undiagnosed. About 16% of patients presenting with hypertensive crises have no prior medical history of the condition.

Objective: This study aimed to estimate the prevalence and stages of hypertension among adults (18-60 years) enrolled in the BNT Malaria epidemiology study in rural Bagamoyo District. Additionally, the study sought to examine the association between hypertension and factors such as age, sex and BMI within this infectious disease cohort.

Methodology: A sub-sample analysis was conducted using the BNT000-003 prospective malaria cohort. We evaluated 199 adults aged 18-60 years. Following WHO definition (Hypertension should be greater or equal to 140/90 mmHg), each participant's blood pressure was calculated as the mean of two readings taken one week apart. Data on age, sex and BMI were collected and analyzed using descriptive statistics.

Methodology: Hypertension affected 16.1% (95% CI: 11.6%–21.8%) of the study population in rural Bagamoyo. Prevalence increased significantly with age and obesity, reaching 52.9% in adults aged 55-60 years and 37.5% among obese participants. While most participants 58.8% presented with elevated blood pressure, 2.5% were hypertensive crisis. The data suggests a critical subgroup potentially as high as 5.7% of the population requires urgent cardiovascular care.

Conclusion: The 16.1% prevalence of hypertension observed in this cohort demonstrates a significant, often undetected, hypertension burden within populations primarily monitored for Malaria. Leveraging existing infectious diseases research platforms provides a high yield opportunity for NCD surveillance. We recommend

integrating routine blood pressure screening into infectious disease programs and routine clinical care to facilitate early detection and timely management in resource limited rural settings.

KEYWORDS: Epidemiology

OR-INJ-01

Development and Validation of a Tool to Assess Healthcare Providers' Knowledge, Attitudes, and Practices on rehabilitation of pediatric population with injuries in Northern Tanzania

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Introduction: Rehabilitation is vital for improving outcomes in pediatric injury patients, yet its effectiveness depends on healthcare providers' knowledge, attitudes, and practices (KAP). While KAP surveys are useful for assessing these factors, no standardized data collection tool exists for pediatric injury rehabilitation in our setting.

Objective: To develop and validate a survey tool for assessing healthcare providers' knowledge, attitudes, and practices regarding the rehabilitation of injuries in the pediatric population in Northern Tanzania.

Methods: A methodological study with cross-sectional field validation was conducted among 102 multidisciplinary healthcare providers involved in pediatric injury rehabilitation. A KAP tool was developed through a review of the literature and input from five experts with expertise in rehabilitation and tool development. The tool was piloted with 10 healthcare providers to assess clarity and relevance. Psychometric evaluation assessed reliability, content validity, and construct validity using Confirmatory Factor Analysis (CFA) with model fit assessed through standard indices.

Results: A total of 102 healthcare providers participated. The survey was refined from 72 to 45 items across knowledge (25 items), attitude (10 items), and practice (10 items) domains. The tool showed strong content validity (overall CVI = 0.88), good to excellent reliability ($\alpha = 0.73-0.91$; composite = 0.88-0.96), and acceptable model fit (CFI = 0.91-0.92).

Conclusion: The developed KAP tool demonstrated good validity, reliability, and structural fit, supporting its use in assessing healthcare providers' knowledge, attitudes, and practices in pediatric injury rehabilitation. It addresses a key gap and has potential for use in similar resource-limited settings.

KEYWORDS: Health workforce assessment; Pediatric injury care; Rehabilitation services; Provider competencies; Psychometric evaluation

OR-INJ-03

Prevalence and factors associated with delayed return to pre-injury state among patients with recurrent anterior shoulder dislocation post Open Latarjet procedure: A cross-sectional study at Muhimbili Orthopaedics Institute, Tanzania

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Background: The open Latarjet procedure is a widely used surgical intervention for managing recurrent anterior shoulder dislocations. While this technique is known for its effectiveness in restoring joint stability, a notable proportion of patients experience delayed return to their pre-injury functional state. This study aimed to determine the prevalence and factors associated with delayed return to pre-injury state among patients with recurrent anterior shoulder dislocation who have undergone Open Latarjet procedure at Muhimbili Orthopaedic Institute (MOI).

Methods: A cross-sectional study was conducted at MOI among 73 patients aged 18 years and above, who underwent the Open Latarjet procedure at least one year prior to the study period. Data was extracted from the existing Open Latarjet Registry which comprised patient interviews and clinical assessments. Variables included sociodemographic factors, pre-surgical and post-surgical characteristics. Data was analyzed using SPSS version 25, employing descriptive statistics and logistic regression models to identify factors independently associated with delayed recovery.

Results: The prevalence of delayed return to pre-injury state post Open Latarjet procedure was 27.4%. Unemployed participants had significantly lower odds of delayed return compared to employed individuals (AOR = 0.036, 95% CI: 0.002-0.615, $p = 0.022$). Trauma-related injuries were also associated with lower odds of delayed return compared to other mechanisms (AOR = 0.026, 95% CI: 0.001-0.863, $p = 0.041$). In contrast, participants who underwent surgery more than five years after injury had significantly higher odds of delayed return to their pre-injury state (AOR = 4.121, 95% CI: 1.114-15.274, $p = 0.032$).

Conclusion: Delayed return to pre-injury state was common after open Latarjet procedure and was influenced by employment status, injury mechanism, and surgical timing. Early intervention and individualized care are recommended to improve recovery outcomes.

KEYWORDS: delayed return; shoulder dislocation; pre-injury; open Latarjet; Tanzania

OR-INJ-04

Prevalence and factors associated with low back pain among primary school pupils, dar-es-salaam.

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Background: Low back pain is an increasingly prevalent experience among children with potential to persist or re-emerge throughout adulthood. Despite its long-term clinical significance, there is insufficient epidemiological data regarding its impact on primary school pupils in Tanzania. Therefore, this present study seeks to determine the prevalence, associated factors for Low back pain among primary school pupils in Dar es Salaam.

Methods: A total of 312 pupils from two government and one private primary school in Ilala municipality participated in this cross-sectional study. Participants were selected using two-stage sampling. The modified Back Pain and Body Posture Evaluation Instrument for Children and Adolescents (BackPEI-CA) questionnaire was used to collect data (socio-demographic characteristics, lifestyle factors, school related factors such as school bag weight, and carrying style). Association between LBP and factors were analyzed by using the multi-variable Poisson regression model, with p-value 0.05 considered statistically significant.

Results: The three-month prevalence of LBP was 58.7% (183/312), with 27.5% of affected pupils experiencing pain more than once per week. Multivariable Poisson regression identified participation in high intensity sports (Adjusted Risk Ratio [ARR]=1.35, $p=0.012$), studying in bed (ARR=1.28, $p=0.031$), and father's education level (ARR=1.20, $p=0.045$) as significant risk factors for LBP. Conversely, adequate sleeping duration (ARR=0.78, $p=0.022$) was protective. No significant association was found with school bag weight (ARR=1.01, $p=0.807$) or sex (ARR=1.11, $p=0.265$).

Conclusion: LBP is a common condition among primary school pupils influenced by lifestyle and socio-economic factors. Therefore, public health interventions such as postural education, learning environmental designs, and guidelines on safe sports programs should be implemented to mitigate LBP and its impact on pupils' daily activities.

KEYWORDS: |low back pain |pupil| dar es salaam

OR-INJ-05

Knowledge and practices of parents/caregivers on prevention of accidental poisoning in children less than 5 years in Dar es Salaam, Tanzania.

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Background: Poisoning remains a leading cause of unintentional injury among children globally, with those under five particularly vulnerable due to curiosity and exploratory behavior. This study assessed the knowledge and preventive practices of parents and caregivers regarding accidental poisoning among children under five years in Dar es Salaam, Tanzania.

Methods: A cross-sectional study was conducted with 414 caregivers attending at Aga Khan Hospital and its Polyclinics in Dar es Salaam. Data were collected using a pretested structured questionnaire covering demographic characteristics, knowledge of poisoning risks, preventive practices, storage of hazardous substances, sources of child safety information, and first aid responses to poisoning events. Multiple linear regression analysis assessed associations between selected independent variables and caregivers' knowledge and preventive practice scores, with $p \leq 0.05$ considered statistically significant.

Results: Among the 414 caregivers, 72.9% were female. The mean knowledge score was 80%, and 88.2% recognized that poisoning could occur within the home. Preventive practices were suboptimal: only 51.4% stored medicines safely, 15.5% stored cleaning products appropriately, and 94.2% used unsafe containers for kerosene storage. Prior childhood poisoning was reported by 43.2% of caregivers. In response to poisoning, 60.3% reported administering milk, while only 40.2% identified immediate referral to a health facility without oral administration as the appropriate action. Caregiver age, education level, and family structure were independently associated with knowledge scores, explaining 13.3% of the variance ($R^2=0.133$). Education level was the only factor independently associated with preventive practice scores.

Conclusion: Despite relatively high knowledge levels, preventive practices among caregivers were inadequate. Strengthening caregiver education on safe storage of hazardous substances and poisoning prevention is essential. Public health messaging should be simplified to reach caregivers with lower literacy levels. Policy measures promoting safe kerosene storage containers and establishing poison management services may improve early response and reduce childhood poisoning risks.

KEYWORDS: Childhood poisoning; Caregiver knowledge; Poison prevention; Household chemical safety; First aid practices; Under-five children.

OR-INJ-06

Knowledge, Attitudes and Practices toward Pediatric Injury Rehabilitation among Healthcare Providers at a Zonal Referral Hospital in Northern Tanzania: A Mixed-Methods Study

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Background: Pediatric injury is a significant public health concern in low- and middle-income countries (LMICs), contributing to disability and impaired child's development milestones. Despite the critical role of rehabilitation in recovery and reintegration into the community, limited information exists on knowledge, attitudes and practices (KAP) to rehabilitation of pediatric injury among healthcare providers in Tanzania. This study aims to assess knowledge, attitudes and practices of healthcare providers in rehabilitation of pediatric injury patients and identify key barriers to effective service delivery at a zonal referral hospital in Northern Tanzania.

Methods: A sequential explanatory mixed-methods study was conducted among healthcare providers at a zonal referral hospital in northeastern Tanzania. Quantitative KAP data on pediatric injury rehabilitation were collected using a structured questionnaire and analyzed using Pearson's correlation, multivariable linear regression, and structural equation modeling. Qualitative data on perceived barriers were thematically analyzed to contextualize the findings.

Results: A total of 210 healthcare providers participated (median age 30 years; IQR 27–35). Mean KAP scores were 32.1 (SD 6.1), 28.2 (SD 4.3), and 24.3 (SD 5.1), respectively. Knowledge was moderately associated with attitudes and weakly with practice, with attitudes mediating the relationship between knowledge and practice ($\beta=0.412$, $p<0.001$). Qualitative findings identified key barriers, including workforce shortages, lack of referral protocols, and limited rehabilitation awareness.

Conclusion: Healthcare providers had moderate knowledge and positive attitudes toward pediatric injury rehabilitation, but knowledge did not consistently translate into practice. Attitudes mediated this relationship, and strengthening rehabilitation training and referral pathways may improve implementation.

KEYWORDS: Knowledge Attitude Practices; Rehabilitation services; Pediatric injuries; Healthcare providers

OR-INJ-07

Explaining Risk Factors for Pedestrian fatalities in Tanzania using a Mixed-Effects Logit Regression Analysis

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Background: Road traffic injuries remain a major public health concern in Tanzania. Statistics show that nearly 1,800 individuals lost their lives and approximately 2,800 sustained injuries on Tanzanian roads, with pedestrians accounting for about 26% of all fatalities. This highlights the urgent need for context-specific evidence on factors contributing to pedestrian fatality risk. **Aim:** This study aimed to identify and quantify factors associated with fatal pedestrian road traffic injuries in Tanzania using national-level crash data.

Methods: A retrospective analytical study was conducted using pedestrian crash data from 2015 to 2017. Standard logistic regression and mixed-effects logistic regression models were applied to assess the influence of roadway, vehicle, and pedestrian characteristics on the likelihood of fatal outcomes. The mixed-effects approach accounted for unobserved heterogeneity and clustering effects of the region.

Results: Several factors were significantly associated with increased odds of fatal pedestrian outcomes. These included crossing at junctions, involvement of trucks or buses, walking along trunk or regional roads, rural road settings, and unpaved road surfaces. Lack of traffic control or reliance on sign-controlled intersections, as well as

nighttime conditions, further increased fatality risk. In addition, pedestrians aged under 17 years and those aged 35 years and above, as well as males, were more likely to experience fatal outcomes.

Conclusion: Pedestrian fatality risk in Tanzania is strongly influenced by infrastructure characteristics, traffic environment, and demographic factors. The findings demonstrate the importance of integrating infrastructure design, traffic control, and behavioural considerations into road safety strategies. Recommendations: Targeted interventions are required, including the provision of safe mid-block crossing facilities, improved street lighting and nighttime visibility, strengthened speed management on trunk and regional roads, and public awareness campaigns focusing on high-risk groups. These findings provide evidence to inform data-driven pedestrian safety policies and interventions in Tanzania.

KEYWORDS: Tanzania; pedestrian safety; pedestrian fatality risk; logistic regression; mixed-effects model

OR-MENT-01

Traditional Care, Stigma and Mental Health Care-Seeking Pathways in Tanzania; A Scoping review

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Background: Mental disorders are among the leading contributors to the global burden of disease. Cultural, traditional, and religious values play a central role in mental health interpretation and care-seeking pathways. Mental disorder stigma can lead to delayed use of medical services, poor treatment adherence, and discontinuity of care. We conducted a scoping review aimed at traditional care intersection with stigma and its effects on care-seeking pathways in Tanzania.

Methods: This review followed a scoping review framework by Joana Briggs Institute, and the search was conducted on MEDLINE, Embase, PsycINFO, PubMed, Web of Science, and Scopus data bases. Articles published up to June 2025 were included in the study. Article review was done independently using Covidence. Data were extracted using a standardized extraction form and synthesized thematic content analysis was performed guided by Braun and Clarke framework.

Results: A total of 27 articles met the inclusion criteria. The majority of studies employed cross-sectional designs with depression and anxiety being the most frequently studied conditions, most were conducted in urban and within hospital settings. Stigma was identified as a major barrier to care seeking among individuals with mental disorders, where public stigma was the most frequent reported form. High preference of traditional care was observed; traditional healers, religious leaders, and faith-based practices were commonly the first point of mental health care. Combined or blended traditional and biomedical care was highly recommended for timely treatment and reduce stigma-related delays.

Conclusion: Our study has revealed stigma as significant barrier to care-seeking among individuals with mental disorders, often delaying access to appropriate treatment. The strong preference for traditional care highlights the need to recognize and integrate culturally accepted practices within the formal healthcare system. Policy efforts should prioritize integrating traditional and biomedical care alongside community-based awareness to reduce stigma and promote timely care-seeking.

KEYWORDS: Mental Health; Stigma; traditional care

Prevalence and factors associated with depression and burnout among frontline healthcare workers in a resource-limited setting: A national multicenter cross-sectional study from Tanzania

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Background: Healthcare workers (HCWs) are at high risk of burnout and depression during pandemics, particularly in low-resource settings. In Tanzania, national data on HCWs' mental health during COVID-19 are limited. This study aimed to assess the prevalence and factors associated with depression and burnout among frontline healthcare workers in Tanzania's five largest public tertiary hospitals.

Methods: A cross-sectional study was conducted from March to June 2024 among 202 healthcare workers of different cadres across Tanzania's five largest tertiary hospitals. Data were collected using questionnaires, including the Patient Health Questionnaire-9 (PHQ-9) for depression and the Descriptive statistics summarized the data, and multivariable logistic regression identified independent predictors, expressed as odds ratios (OR) with 95% confidence intervals (CI). Statistical significance was set at $p < 0.05$.

Results: Overall, 48.0% of participants screened positive for depressive symptoms and 38.1% met criteria for high burnout. Mild depression was most common (35.6%) and high burnout was more frequent in direct patient-contact roles and high-intensity departments. In multivariable analysis, direct patient contact was associated with higher odds of burnout (adjusted POR 2.45; 95% CI 1.23 to 4.88; $p = 0.011$). No sociodemographic factors were significantly associated with depression or burnout after adjustment.

Conclusion: Depression and burnout were common among frontline healthcare workers with direct patient contact showing significant association with burnout. These findings highlight the need for organizational interventions to protect staff wellbeing in resource-limited settings. Targeted strategies for frontline healthcare workers are essential, and future large scale, longitudinal research should evaluate scalable interventions in low-resource settings.

KEYWORDS: Burnout; depression; frontline; pandemic; COVID-19; healthcare workers; Tanzania

Mental health literacy and associated factors among secondary school students in Dodoma city council: A mixed method study

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Background: Mental disorders are among the leading causes of health loss worldwide and disproportionately affect adolescents and youths. Mental disorders and the resulting negative psychosocial impact have been

associated with low mental health literacy (MHL). There is, however limited data on MHL among adolescents in Tanzania. This study aims to assess mental health literacy and the associated factors among secondary students in Dodoma City Council.

Methods: We utilized a mixed methods study design. A structured questionnaire consisting of the mental health literacy questionnaire for young adults (MHLq) and questions on sociodemographic factors, was used to collect information from 427 students attending public secondary schools in Dodoma city. We also conducted in-depth interviews (IDI) with 12 students from the schools.

Results: We found 55.3% of students had adequate MHL level. Lower levels of mental health literacy were significantly associated with several factors: lower parental or guardian education level (AOR = 7.9, 95% CI: 3.05–20.45, $p < 0.001$), lack of prior exposure to mental health information (AOR = 5.51, 95% CI: 3.09–9.85, $p < 0.001$), not having participated in mental health programs (AOR = 4.75, 95% CI: 2.81–8.03, $p < 0.001$), not having direct encounters with individuals experiencing mental illness (AOR = 2.42, 95% CI: 1.27–4.63, $p = 0.007$), and not being comfortable discussing mental health issues (AOR = 4.04, 95% CI: 2.26–7.21, $p < 0.001$). IDI revealed unclear distinction between the term mental health and mental illness among many students. There were mixed views about interaction with people with mental illness.

Conclusion: MHL among secondary school students is influenced by both individual and contextual factors. These findings underscore the need for targeted mental health education interventions in schools, community awareness programs, and family engagement to enhance MHL and ultimately improve adolescent mental health outcomes.

KEYWORDS: mental health literacy; students; secondary schools; Tanzania

OR-MENT-04

Mental Disorder Comorbidity, Traumatic Experiences, and Coping Among People Living with HIV: A Cross-Sectional Study of Post-Traumatic Stress, Depression, Anxiety, and Suicidality in Kilimanjaro, Tanzania

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Background: Post-traumatic stress (PTS) is common among People Living with Human Immunodeficiency Virus (PLHIV), and frequently co-occurs alongside other mental health challenges. This study aimed to determine the prevalence and co-morbidity rates of PTS, depression, anxiety and suicidality, types of traumatic experiences, and preferred coping styles in a setting with limited integration of mental health screening and intervention.

Methods: A cross-sectional survey was conducted with 379 adults receiving HIV care at two hospitals in Kilimanjaro, Tanzania, between December 2025 and March 2026. We used locally-adapted screeners; the PTS Disorder Checklist (PCL-5), the Brief Symptom Inventory (BSI-6) for anxiety, and the Patient Health Questionnaire-9 (PHQ-9) for depression. Item 9 of the PHQ-9 was split to distinguish passive and active suicidality. The BriefCOPE scale was used to identify preferred coping styles and the Stressful Life Events Screening Questionnaire (SLESQ) for traumatic experiences. Descriptive statistics and Chi-square tests were applied.

Results: Prevalence rates were 10.6% for PTS, 9.5% for depression, 11.1% for anxiety, 14% for passive suicidality, and 4% for active suicidality. Significant co-morbidity was observed between PTS and depression (11.9%, $p < 0.001$), and PTS and anxiety (8.7%, $p < 0.001$). Participants reported a mean of three traumatic experiences (range 0–13, $SD \pm 2$), most commonly ‘life-threatening illness’ (78.8%), ‘traumatic separation/divorce’ (54.2%), and ‘transport-related accident’ (33.3%). The adaptive problem-solving domain was most preferred (mean = 2.9/4). The highest-rated individual coping styles were ‘religious beliefs’ (2.49/4) and ‘seeking distractions’ (2.34/4). The lowest-rated coping styles were the maladaptive ‘alcohol/drugs’ (0.25/4) and ‘giving up’ (0.3/4).

Conclusion: PTS frequently co-occurs with depression and anxiety among PLHIV. Integration of transdiagnostic mental health interventions into HIV care is vital to address co-occurring challenges, particularly in resource-limited settings where speciality care is highly inaccessible.

KEYWORDS: depression; trauma; comorbidity; transdiagnostic approach; HIV

OR-MENT-05

Understanding Primary School Environment as a Social Determinant of Children's Mental Health

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Background: Schools greatly influence children's cognitive, emotional, and social development, thereby impacting mental well-being. However, there is limited research on how school environments affect mental health in low- and middle-income countries like Tanzania. The Shule Inajoyali study aims to develop psychometric tools to assess the effect of the primary school environment (PSE) on children's mental health in Tanzania. This research gathered insights from educational experts regarding the PSE and its influence on students.

Methods: Qualitative in-depth interviews were conducted with educational and mental health experts. Experts were purposively selected, and interviews were conducted using a guide to define and measure the PSE. Data was gathered through online interviews in Kiswahili (n=4) and English (n=8), recorded, and transcribed. Kiswahili transcripts were translated into English and analysed thematically.

Results: Experts described the school environment as a holistic concept encompassing both physical and human elements. Four key features impacting students' mental health emerged: (1) teaching and leadership strategies that promote cooperation, (2) respectful teacher-student relationships, (3) strong community links among staff, parents, and the wider community, and (4) the physical environment, including infrastructure. Positive relationships between students and teachers were emphasised as critical for creating a sense of belonging, helping students seek support and improving mental health. Community engagement and school leadership were seen as essential. Structural challenges facing PSEs included low teacher salaries, poor working conditions, and top-down policymaking. Adequate resources for safety and basic needs, such as clean water and meals, were recognised as important for well-being. Discussion and

Conclusion: Experts recognised the significance of the school environment and proposed strategies to enhance it by addressing challenges faced by schools and students. However, structural issues specific to Tanzania may impede these efforts. A comprehensive evaluation of the PSE should consider its complexity and the diverse factors impacting children's mental health.

KEYWORDS: School environment; mental health; children; Tanzania

OR-MENT-06

The Overlooked Mental Health Burden of Caregivers of Children with Disabilities.

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Introduction: Caregivers' mental health is a vital yet frequently overlooked component of supporting children with disabilities. Although there is a dearth in evidence-based research on the health and economic needs of these caregivers, they encounter significant psychological challenges such as stigma, and social exclusion, which can adversely affect their well-being.

Objective: To assess how the demands of caring for children with disabilities influence the mental health and well-being of caregivers in Tanzania.

Methods: Sixteen in-depth interviews were conducted with primary caregivers of children with disabilities, including 12 women and 4 men. The children, aged 0–16 years, had developmental, physical, intellectual, sensory disabilities, or autism spectrum conditions. Interviews addressed parenting, access to healthcare, stigma, and caregivers' psychological needs. Thematic analysis identified patterns in caregiving practices and the psychological well-being of caregivers.

Results: Four key themes emerged regarding caregivers' mental health. Limited access to health services, including delayed diagnosis and insufficient support, increased anxiety and helplessness. Psychological distress, such as confusion, guilt, anxiety, and grief, was closely linked to ongoing caregiving demands. Stigma and social exclusion within families and communities intensified emotional strain and isolation. Economic and practical barriers further contributed to emotional exhaustion. These combined pressures sometimes led to negative coping mechanisms, including neglect, emotional withdrawal, anger related verbal and physical abuse toward children, and withdrawal from social networks. This highlights the urgent need for integrated mental health support.

Conclusion: Caregivers of children with disabilities face significant psychological strain, which can lead to harmful coping behaviors. Targeted mental health interventions, psychosocial support, caregiver training, and anti-stigma initiatives are essential. Integrating mental health services into primary care will help build resilience and improve outcomes for caregivers and their families.

KEYWORDS: Public health; mental health; disabilities; caregivers; tanzania

OR-MENT-07

Prevalence, Clinical Pattern, and Factors Associated with Posttraumatic Stress Disorder Among Opioid and Non-Opioid User in Dodoma, Tanzania: A Comparative Cross-Sectional Study

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Background: Posttraumatic stress disorder (PTSD) is highly prevalent among individuals with substance use disorder (SUD). Despite a high number of people who use drugs in Tanzania, there is limited evidence on PTSD among this population. This study assessed the prevalence, clinical patterns, and associated factors of PTSD among individuals with opioid use disorder (OUD) attending medication-assisted therapy (MAT) clinics compared to non-opioid users attending general outpatient clinics.

Methods: A comparative cross-sectional study was conducted among 154 MAT clients and 308 general outpatient attendees. PTSD and related factors were assessed using standardized tools: the Adverse Childhood Experiences (ACE) checklist, Life Event Checklist (LEC-5), and PTSD Checklist (PCL-5). Comparative and regression analyses were performed.

Results: The prevalence of PTSD was 61.04% among opioid users and 27.92% among non-opioid users. All opioid users reported experiencing more than one lifetime traumatic event, and 64.94% experienced childhood

adversities. Opioid use (AOR 2.262, 95% CI: 1.249–4.097, $p=0.0070$) and unemployment (AOR 4.242, 95% CI: 1.367–13.163, $p=0.0124$) were significantly associated with PTSD. Among non-opioid users, childhood adversities were associated with PTSD (AOR 2.06, 95% CI: 1.03–4.12, $p=0.0419$).

Conclusion: PTSD is prevalent among opioid users compared to non-opioid users. Routine PTSD screening and trauma-informed care should be integrated into MAT services to improve treatment outcomes. Further multicenter and longitudinal studies are recommended.

KEYWORDS: posttraumatic stress disorder; Opioid users; Medication Assisted Therapy; Tanzania

OR-MENT-08

Prevalence of Potential Mental Health Disorders among Adults Living in Drought-Affected and Non-Drought Areas in Tanzania

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Background: Climate change, through prolonged drought, threatens agricultural livelihoods and compels behavioural adaptations that may gradually affect mental health. This study compared the prevalence of mental disorders among Tanzanian adults in drought-affected versus non-drought areas.

Methods: A cross-sectional study was conducted among adults aged 18 years and above, recruited from community settings using multistage sampling. Depression was evaluated using the Patient Health Questionnaire-9 (PHQ-9 ≥ 10), and probable common mental disorder (CMD) (e.g., anxiety, depression, psychosomatic symptoms) using the WHO Self-Reporting Questionnaire-20 (SRQ-20 ≥ 8), a validated tool for detecting CMD in low-resource settings. Multivariable logistic, multinomial logistic, and Poisson regression examined associations with depression severity and CMD, adjusting for sociodemographic and economic factors.

Results: Among 2,871 participants (49.3% non-drought, 50.7% drought), the overall prevalence of depression was 6.2% (6.4% drought; 6.1% non-drought), and probable CMD was 33.8% (31.8% drought; 35.9% non-drought). Food insecurity was the strongest predictor of depression (OR 3.15, 95% CI 1.76–5.65), with odds exceeding fourfold among migrants (OR 4.29, 95% CI 1.75–10.55). Across severity levels, food insecurity predicted mild (score 5–9) (PR 2.11, 95% CI 1.58–2.81) and moderate depression (score 10–14) (PR 3.94, 95% CI 2.04–7.59), with food-insecure migrants five times more likely to experience moderate depression (PR 5.01, 95% CI 1.85–13.56). High socioeconomic status was consistently protective against depression (OR 0.66) and CMD (PR 0.80). Food insecurity remained the strongest CMD predictor (PR 1.91, 95% CI 1.58–2.30). Male sex was associated with 30% lower CMD prevalence (PR 0.70), while alcohol use (19%), smoking (23%), and older age at 40–49 and 60+ (40%) were associated with significantly higher CMD prevalence.

Conclusion: Drought operates not as a direct psychological stressor but as a structural driver of mental disorders, primarily through food insecurity and low socioeconomic status. Among migrants, settlement instability and reduced resource access further amplify psychological vulnerability.

KEYWORDS: Depression; Common Mental Disorders; Drought; Adults

OR-NCD-01

Association between drought exposure and dysglycaemia among Tanzanian adults: A cross-sectional study

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Background: Drought, one of the most severe extreme weather events, threatens glucose homeostasis by disrupting food systems and livelihoods. These disruptions can compromise food security, dietary quality, and physical activity patterns, thereby increasing the risk of dysglycaemia. However, the relationship between drought exposure and dysglycaemia remains poorly understood in sub-Saharan Africa. This study investigated the association between drought exposure and dysglycaemia among Tanzanian adults.

Methods: We conducted a cross-sectional study among 2,986 adults residing in districts classified as drought-prone or non-drought-prone using the Standardized Precipitation Index. Dysglycaemia subtypes (isolated impaired fasting glucose [IFG], isolated impaired glucose tolerance [IGT], combined IFG+IGT, and diabetes) were defined based on fasting plasma glucose and 2-hour oral glucose tolerance tests. Multinomial logistic regression with cluster-robust standard errors was used to estimate adjusted relative risk ratios (aRRR).

Results: Drought exposure was associated with significantly higher risk of isolated IGT (aRRR 2.05; 95% CI 1.74–2.41; $p < 0.001$) and combined IFG+IGT (aRRR 2.59; 95% CI 1.46–4.59; $p = 0.001$), but not with isolated IFG (aRRR 1.12; 95% CI 0.91–1.37; $p = 0.323$) or diabetes (aRRR 0.81; 95% CI 0.50–1.32; $p = 0.391$). These associations remained independent of age, sex, residence, season, nutritional vulnerability, and district-level development.

Conclusion: Drought exposure is specifically linked to post-load dysglycaemia (impaired glucose tolerance), suggesting that drought preferentially impairs glucose tolerance rather than fasting glucose regulation. Screening programs relying solely on fasting glucose measurements may substantially underestimate the burden of dysglycaemia in drought-affected populations. Oral glucose tolerance testing should be incorporated in such settings.

KEYWORDS: Drought; climate change; dysglycaemia; diabetes; Tanzania

OR-NCD-03

Prevalence and Determinants of Self-Reported Non-Communicable Diseases Among Adults Aged 18–69 Years in Tanzania: Evidence from the 2022–2023 Tanzania HIV Indicators Survey

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Introduction: Non-communicable diseases (NCDs) are a growing public health concern in low- and middle-income countries, including Tanzania, contributing substantially to morbidity and mortality. However, nationally representative evidence on the burden of self-reported NCDs and their key determinants remains limited.

Objective: To estimate the prevalence of self-reported non-communicable diseases and identify determinants among adults aged 18–69 years in Tanzania.

Methods: The 2022–2023 Tanzania HIV Indicators Survey (THIS) enrolled 35,957 individuals, of whom 30,895 aged 18–69 years were included in this analysis. Data were extracted from the main survey database, including socio-economic, demographic, behavioural risk factors and clinical characteristics. The outcome variable was defined as reporting at least one of the following conditions: diabetes, hypertension, heart disease, kidney disease, cancer or tumor, lung disease or depression or other mental health conditions. Chi-square tests and logistic regression analyses were done to assess determinants of the prevalence of self-reported NCDs.

Results: The prevalence of self-reported non-communicable diseases was 3.54% (95% CI: 3.16–3.96). Higher odds of NCDs were observed among females (aOR = 1.90, 95% CI: 1.58–2.28), individuals aged 31–45 years (aOR=2.78, 95% CI: 2.22–3.47) and 46–69 years (aOR =9.91, 95% CI: 8.09–12.14), divorced or separated (aOR=1.86, 95% CI: 1.36–2.56) and widowed individuals (aOR=1.81, 95% CI: 1.32–2.47), those in the middle (aOR = 1.62, 95% CI: 1.20–2.19), fourth (aOR=1.96, 95% CI: 1.44–2.66) and highest wealth quintiles (aOR=2.87, 95% CI: 2.07–3.99), and residents of Southern Highlands (aOR=1.64, 95% CI: 1.05–2.55), Southern (aOR=1.58, 95% CI:

1.00–2.47) and Zanzibar (aOR=1.62, 95% CI: 1.07–2.44).

Conclusion: NCDs were significantly associated with sex, increasing age, marital status, higher wealth status and geographic location, highlighting the need for targeted prevention and control strategies focusing on high-risk population groups.

KEYWORDS: Self-report prevalence of NCD; THIS and Determinants

OR-NCD-04

Prevalence and factors associated with depressive symptoms among adults with glaucoma at a tertiary hospital in Tanzania: A cross-sectional study

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Background: Glaucoma is identified as one of the leading causes of blindness worldwide. Its chronic nature and the potential for irreversible vision loss contribute to significant distress among affected individuals. Around 25% of individuals with glaucoma are estimated to experience depression, negatively impacting their quality of life and treatment adherence. However, data on the prevalence of depression among people with glaucoma in Tanzania is limited. This study aimed to determine the prevalence and factors associated with depressive symptoms among adults with glaucoma at Muhimbili National Hospital.

Materials and Methods: A cross-sectional study was conducted involving 297 adults with glaucoma, who were recruited consecutively from the ophthalmology clinic at Muhimbili National Hospital between July and November 2024. Data on biopsychosocial factors were collected using interviewer-administered questionnaires and medical records. Patient Health Questionnaire-9 and Oslo Social Support Scale assessed depressive symptoms and social support, respectively. Data were analyzed using STATA version 16. Logistic regression analyses identified factors associated with probable depression, with statistical significance set at p-value<0.05.

Results: The mean age of participants was 63.6 years (SD±12.8), with 159 (53.5%) being female. Prevalence of probable depression was 11.1%, with 8.7% having moderate, 2.4% moderately severe, and none reporting severe depressive symptoms. Having moderate social support (AOR 0.14; CI: 0.04–0.47; P=0.001) and strong social support (AOR 0.08; CI: 0.03–0.25; P<0.000) were significantly associated with lower odds of probable depression.

Conclusion: Approximately 1 in 10 individuals with glaucoma experience depression. Having good social support was identified as a protective factor against depression in people with glaucoma. These findings underscore the need for a multidisciplinary approach integrating psychosocial services into ophthalmology clinics.

KEYWORDS: Depressive symptoms; Glaucoma; Patient Health Questionnaire-9; Depression; Social Support

A qualitative study on communities' and stakeholders' perceptions about climate change and its link to Non-Communicable Diseases (NCDs) in Tanzania.

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Background: Climate change is a growing public health concern in Tanzania. Increasing climate variability threatens the livelihoods of farming communities and potentially exacerbating long-term health conditions including non-communicable diseases (NCDs), through food insecurity and psychosocial stress. The study explored the perceptions of local communities and stakeholders regarding the links between climate change events, their socioeconomic consequences, long-term health outcomes and migration, while identifying existing coping strategies to inform future interventions.

Methods: A qualitative study was conducted on the impact of climate change on health in Tanzania. The study was conducted in Dodoma, Bahi, Same, and Uvinza districts between May 2024 and April 2025. Purposive sampling was used to select community members and stakeholders who participated in 80 in-depth interviews (IDIs) and 6 focus group discussions (FGDs). Key informant interviews were conducted with 15 professionals and officials. Analysis followed a thematic- content approach supported by NVIVO software. Findings: Participants identified a shift toward frequent severe droughts (notably in 1961, 1977, and 2007), however 1998 and 2023 were marked by heavy rains (El Nino). Most participants reported climate change events (drought and heavy rains) causing food insecurity, death of livestock and property loss. They saw these as linked to health conditions such as malnutrition, hypertension, depression and anxiety. Drought led to "one meal per day" dietary shifts, and migration. Among the frequent reported coping/ adaptation strategies were dietary adjustments, migration to other areas, and shifting from farming to fishing or other income generating activities. Government support included subsidized food (maize/millet) and tree-planting campaigns.

Conclusion: Communities and stakeholder in Tanzania recognize climate change events as drivers of ill health including NCDs and migration. There is a need to raise community awareness to build resilience against both weather events and the growing NCD crisis, including more efforts to protect water sources and environmental conservation

KEYWORDS: Climate change; Tanzania; Public health; Non-communicable diseases (NCDs); Qualitative study; Food insecurity; Migration; Coping strategies.

How patients and providers understand and manage Asthma: a qualitative study from Arusha, Tanzania.

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Background: There is a high burden of chronic respiratory symptoms and diseases in low- and middle-income countries, with limited support for chronic respiratory care. Despite this burden, there is little understanding of how affected individuals experience and respond to these conditions in their daily lives.

Methods: We conducted in-depth interviews in three primary health facilities in Arusha, Tanzania. Patients diagnosed with asthma (n=8) and healthcare providers (n=3) were interviewed to explore how they perceive and experience respiratory symptoms and diseases. Data were analyzed thematically, informed by the concepts of explanatory models of illness, chronicity, and normalization.

Results: Findings show that patients' acceptance of an asthma diagnosis is influenced by family history and experiences of others with similar conditions. For example, patients were more likely to accept the diagnosis if asthma was already known within their family. In managing symptoms like breathing difficulty or wheezing, many patients reported going directly to pharmacies to purchase medications such as salbutamol or aminophylline. From the providers' perspective: patients' financial capacity and investigation tools such as spirometry influenced diagnostic practices. For example, when patients were unable to afford tests such as chest X-rays, providers often relied on clinical judgement alone in providing respiratory care treatment.

Conclusion: These findings highlight how social experiences and economic constraints shape the understanding and management of respiratory diseases. Insights from this study will inform the co-development of person-centered tools to improve respiratory care in the study settings.

KEYWORDS: Qualitative/social science research

OR-NCD-07

Computational analysis of Urolithin A as a potential compound for anti-inflammatory, antioxidant, and neurodegenerative pathways

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Background: Urolithin A, an active precursor derived from the metabolism of ellagitannins in humans, is known for its potential health benefits, including stimulating mitophagy and promoting musculoskeletal function. While experimental studies have demonstrated Urolithin A's potential to enhance cellular health, the detailed molecular interactions through which Urolithin A exerts its effects remain incompletely elucidated.

Methods: In this study, we investigated the anti-inflammatory, antioxidation and neuroprotective abilities of Urolithin A in selected targets using molecular docking and molecular dynamics simulation methods.

Results: Molecular docking studies revealed the strong affinity for receptors involved in inflammation activities, including human p38 MAP kinase (4DLI) with -10.1 kcal/mol interacting with SER252, LYS249, and ASP294 residues. The binding energy in the 5KIR target was -8.6 kcal/mol, interacting with GLN203 through hydrogen bond, and lastly, 1A9U with an affinity of -6.8 with no hydrogen bond formed with Urolithin A and interacts with van der Waals interactions. In oxidant targets, the influence of Urolithin was observed in 1OG5 with -7.9 kcal/mol interacting with GLN185, PHE447. For the 1M17 target, the binding affinity was -7.7 kcal/mol interacting with THR95 residue and 1ZXN target at -7.4 kcal/mol interacting with TYR36, TYR216, and LEU234 residues. The neuroprotective ability of urolithin A was observed in selected targets for acetylcholinesterase; the binding energy was -9.7 kcal/mol interacting with van der Waals and π der Waals and π interactions; for the 1GQR target, the binding energy was -9.9 kcal/mol interacting with van interactions and for β -amylase (1iyt) the binding energy was -5.5 forming hydrogen bond with SER8, GLN15 residues.

Conclusion: Molecular Dynamics simulations at 100 ns of Urolithin A compared with reference 4DLI. The Urolithin A-4DLI complex exhibited greater stability than the reference receptor, as confirmed by RMSD, RMSF, Radius of Gyration, Hydrogen bond, and SASA analyses.

KEYWORDS: Urolithin A; Molecular docking; Molecular dynamic simulation; Neurodegeneration; Inflammation; Oxidative stress

Consumption of fortifiable food vehicles and Sugar among women of reproductive age in Mbeya Region: A quantitative 24hour recall Approach

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Background: Women of reproductive age (WRA) are often a target group for interventions to improve nutrition before and during pregnancy. Adequate nutrient intakes among this group are important determinants of maternal, neonatal, and child health outcomes. The study was carried out to inform nutrition stakeholders on the usual intake of fortified food consumed to address nutrient intake.

Objective: To assess the usual intake of the selected potential fortifiable food vehicles and sugar among non-pregnant, non-lactating women of reproductive age (WRA; 15-49 years).

Methodology: A cross-sectional survey with a sample of 500 women using multi-stage cluster sampling. Data collection involved multiple-pass 24-hour recalls and was a repeat recall conducted among a subsample of participants 3-10 days after the baseline interview (n=120). The food consumed was matched with Tanzania and benchmarked with Uganda's food composition tables to determine their nutrient content. SAS macros (SAS Studio version 9.4, SAS Institute Inc. 2013) were further used to estimate the usual quantities consumed of two food fortification vehicles (oil and wheat flour) and sugar.

Results: We found that WRA consumed oil with a median intake of 36.47 grams per day. The median intake from wheat products was 110.53 g per day, with women residing in urban areas showing a significantly higher intake with 142.23 g ($p<0.001$), which is 1.6 times that of rural areas. This study reported sugar consumption with a median intake of 70.5 g per day (homemade was 51.5 g and industrially made 19 g). Higher dietary intake of industrial sugar was observed from urban compared to rural, while oil intake showed no significant difference between the two settings.

Conclusion: Community sensitization on the use of fortified food products is essential to combat micronutrient deficiency; however, caution on the amount consumed is paramount to prevent the emerging overweight and obesity.

KEYWORDS: Women of Reproductive Age (WRA); fortified food products

Challenges in complying with salt regulations among small- and medium-scale salt

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Background: Tanzania has not been able to attain the required universal salt iodization target of 90% since the introduction of the USI program in 1994. One of the main challenges faced is having a substantial number of small- and medium-scale producers who are not actively participating in iodation of the salt they produce. This study aimed to explore challenges that small- and medium-scale salt producers in Tanzania experience in compliance with salt iodization and co create contextual solutions.

Methods: A qualitative descriptive study was conducted in three major salt-producing districts of Hanang, Kilwa, and Mkinga using the first stage of the Human Centered Design (HCD) : Community Driven Discovery Inquiry. Data were collected through 8 focus group discussions (FGDs) with 80 salt producers and 34 key informant interviews (KIIs) with council health management team . NVivo 12 was used for thematic analysis of transcribed data.

Results: Low compliance with salt iodization regulations, this may be due to limited awareness of iodization laws, unavailability and high cost of potassium iodate, inadequate access to iodization machines, and weak regulatory enforcement. Preferences for non-iodized salt and lack of education about the health benefits of using iodine was also reported to hinder compliance. In addition, salt producers face obstacle during obtaining permits for salt transportation and inadequate infrastructure in salt production areas.

Conclusion: Compliance with salt iodization regulations is a challenge among salt producer. Strategies, including government-supported procurement systems, public-private partnerships, and subsidies for small-scale producers, could improve compliance hence eliminate iodine deficiency and its related health impacts.

KEYWORDS: Compliance; HCD; salt-producers; regulations; salt; Tanzania

OR-NUTR-03

Barriers and Enablers to the Successful Implementation of Group Salt Iodation among Small- and Medium-Scale Producers in Tanzania: A Human-Centered Design Qualitative Study

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Background: Iodine is vital for thyroid hormone production, brain development, and overall health. This study explored barriers and enabling factors affecting the implementation of the group salt iodation model among small- and medium-scale salt producers in Tanzania.

Methods: A qualitative descriptive study was conducted in the Hanang, Kilwa, and Mkinga districts of mainland Tanzania. These districts were purposively selected due to high salt production and low household coverage of adequately iodized salt. Data were collected through Focus Group Discussion (FGD) with salt producers, while key informants' interviews were conducted with selected USI implementers (government officers) at the district level. All data were analyzed thematically using NVivo 12 with a deductive coding framework.

Results: A total of 109 participants were enrolled, including 80 (73%) small- and medium-scale salt producers and 29 (27%) government officials. Most participants were male (76%), aged 41-50 years, with 52% having completed primary education. Key findings highlighted four major themes: (i) Knowledge barriers, including low education among salt producers and misconceptions about iodized salt; (ii) Production challenges involved the unavailability and high cost of potassium iodate, poor infrastructure, and limited machine capacity; (iii) Leadership issues, including conflicts and lack of trust within salt producer groups; and (iv) Budgetary shortfalls in council plans affected support for salt production. The study indicated further that access to microfinance, quality control, community engagement, and supportive governance were interlinked factors that enabled and facilitated the group consolidation model.

Conclusion: The implementation of group salt iodation faces key challenges, including knowledge gaps, production issues, leadership challenges, and budget constraints. Using participatory approaches such as Human-Centered Design (HCD) might help salt producers, together with USI implementers, co-design sustainable solutions that suit better their local context to improve the production of quality, adequately iodized salt, especially in resource-limited settings of Tanzania.

KEYWORDS: salt production; barriers; enablers; human-centered design; Tanzania

Prevalence, sub-types, and associated factors of anemia among inpatients at a tertiary psychiatric hospital in Tanzania: a cross-sectional study

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Background: Anemia has been linked to psychiatric disorders including depression, bipolar disorder, and schizophrenia. Studies have demonstrated an association between anemia and worsening clinical presentation and treatment outcomes of these disorders. This study aimed to assess the prevalence and factors associated with anemia among adult patients admitted at Mirembe National Mental Health Hospital (MNMH) in Dodoma, Tanzania.

Methods: A cross-sectional analytical study was conducted at MNMH among 265 adult patients admitted at the hospital. Socio-demographic and clinical variables were collected using a questionnaire, and anemia and other hematological indices were assessed via complete blood count (CBC). Data were entered into an Open Data Kit (ODK) app and analyzed using SAS (previously Statistical Analysis Software) version 9.4. Chi-squared tests were used to assess associations between socio-demographic and clinical variables and anemia. Variables with $p < 0.20$ were included in a logistic regression model. Adjusted odds ratios identified independent factors associated with anemia, with statistical significance set at $p < 0.05$.

Results: The prevalence of anemia among patients admitted at MNMH was 44% (CI 38.08, 50.36). The majority of participants had mild anemia (74.36%). Microcytic hypochromic and normocytic normochromic were the common types of anemia (47% and 46% respectively). Being male, institutionalization, and using Olanzapine was associated with anemia among participants at bivariate analysis, however, only institutionalization remained as a statistically significant factor associated with anemia at multivariable analysis (AOR:5.742, 95% CI 2.048, 16.105).

Conclusion: Comprehensive care strategies addressing anemia among psychiatric inpatients are crucial, extending beyond psychiatric symptoms to address factors related to prolonged admission, such as nutritional considerations. It is recommended that regular screening for anemia be implemented among psychiatric inpatients and efforts should be made to investigate and address the underlying causes of anemia among this population.

KEYWORDS: Anemia; Psychiatric patients; Prevalence; Factors; Dodoma; Tanzania

Caregivers' Experiences and Perceptions of Psychosocial Stimulation in the Management of Severe Acute Malnutrition in Tanzania.

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Introduction: Severe Acute Malnutrition (SAM) remains a major contributor to child morbidity and impaired cognitive development in low-resource settings. Beyond nutritional rehabilitation, psychosocial stimulation(PS) is increasingly recognized as essential for improving both survival and developmental outcomes. However, evidence on caregiver experiences with PS interventions in routine health systems in Tanzania remains limited. This study explored caregiver experiences and perceptions on PS intervention among caregivers of SAM children.

Methodology: A qualitative descriptive study was conducted among caregivers of SAM children. Data were collected through in-depth interviews using an open-ended interview guide. Forty caregivers who PS intervention sessions were purposively selected for participation until data saturation was reached. Interviews were transcribed, translated, and analyzed thematically using NVivo software.

Results: Caregivers initially had limited knowledge of malnutrition, often associated illness to non-nutritional causes, stigma was mentioned as barrier for early SAM identification and community health workers played a critical role in identifying and linking children to healthcare. PS intervention was associated with marked improvements in children's cognitive, motor, and social development, including children increased activeness, play independently, and active engage with peers. Caregivers reported enhanced knowledge of child feeding practices, improved dietary diversity, strengthened caregiver-child bonding, increased household child stimulation and reduced stress. Positive relationships with healthcare providers, availability of transport money and faster child recovery facilitated engagement and retention. Family support and closer monitoring from the health provider strengthened intervention uptake. However, challenges including long distance to the health facility, limited support from other family members, overwhelmed by the other family responsibility and unavoidable events such as funerals hindered smooth participation. Conclusion and recommendations; Psychosocial stimulation intervention was perceived as effective in improving child health and development and improved responsive caregiving among caregivers. Integrating PS intervention within routine SAM management systems may improve outcomes for children with SAM and responsive caregiving behaviors

KEYWORDS: Severe Acute Malnutrition; psychosocial stimulation intervention; caregivers of SAM children; Tanzania

OR-NUTR-06

Determinants of Knowledge of Salt Intake and Its Association with Salt-Related Practices Among Regular Street Food Consumers in Dar es Salaam

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Background: Excessive salt intake is a major modifiable risk factor for hypertension and cardiovascular diseases, which are increasing in urban settings across Tanzania. In Dar es Salaam, the widespread consumption of street foods may contribute substantially to high salt intake. However, evidence on knowledge of salt intake and its relationship with salt-related practices among regular street food consumers remains limited. Understanding these relationships is essential for designing effective behavioral interventions. This study assessed knowledge of salt intake and its association with salt-related practices among regular street food consumers in Dar es Salaam.

Methods: A cross-sectional baseline survey was conducted among 313 adults aged ≥ 18 years, recruited using multistage sampling from mapped street food vending sites. Knowledge was measured using a composite score and categorized as inadequate or adequate. Salt-related practices and attitudes were dichotomized into poor and good. Socio-demographic variables included age, gender, education, marital status, body mass index (BMI), and socioeconomic status (SES), while elevated blood pressure was also assessed. Logistic regression analyses were performed to identify factors associated with adequate knowledge and to examine its association with salt-related practices. Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) were reported. Overall, 70.9% of participants had adequate knowledge of salt intake.

Results: Knowledge was significantly associated with age, socioeconomic status, and elevated blood pressure in unadjusted analyses. In multivariable analysis, older age, positive attitudes, and salt-related practices remained independently associated with knowledge, while education was not significantly associated.

Conclusion: These findings highlight the importance of behavioral and perceptual factors over formal education in shaping knowledge of salt intake among street food consumers.

KEYWORDS: dietary salt intake; Knowledge attitudes and practices; street food

OR-NUTR-07

The relationship between nutrition and hearing impairment.

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Background: Hearing impairment is a significant global health challenge, particularly affecting children and individuals with developmental vulnerabilities. Emerging evidence suggests that nutrition plays a crucial role in auditory system development and function. Deficiencies in essential nutrients, such as vitamins and minerals, can compromise ear health and exacerbate hearing difficulties. Understanding the link between nutrition and hearing impairment is essential for developing preventive strategies and promoting holistic health interventions.

Methods: A descriptive research design was employed to examine the relationship between nutrition and hearing impairment. Data were collected from scientific literature, health reports, and studies focusing on nutritional factors influencing auditory health. Key variables included intake of vitamins, minerals, and macronutrients essential for ear development and function. Information was synthesized to identify patterns linking nutritional deficiencies with hearing challenges. Ethical considerations were observed by relying solely on publicly available and peer-reviewed sources.

Results: The study findings indicate that inadequate nutrition, particularly deficiencies in vitamins A, B-complex, C, iron, and zinc, is strongly associated with impaired auditory function. Nutrient deficiencies may lead to delayed auditory development, increased susceptibility to infections, and higher risk of sensorineural hearing loss. Diets lacking protein and essential micronutrients were found to exacerbate hearing challenges in children and adults alike. Conversely, balanced diets rich in essential nutrients support proper ear development, enhance nerve function, and mitigate some hearing-related problems. These results underscore the critical role of nutrition in preventing and managing hearing impairment.

Conclusion: Adequate nutrition is essential for maintaining hearing health and reducing the risk of auditory impairments. Health professionals, educators, and communities should promote awareness and implement nutrition-focused interventions. Encouraging balanced diets rich in vitamins, minerals, and proteins can significantly improve auditory outcomes and overall well-being.

OR-NUTR-11

A Whole-Food Nutritional Intervention Model for Supporting Community-Level Health Outcomes in Tanzania: Integrating ARIS SuperFoods into Preventive and Complementary Care Systems

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1. ARIS SuperFoods

Background /

Introduction: Tanzania faces a dual burden of malnutrition, including undernutrition, micronutrient deficiencies (“hidden hunger”), and rising diet-related non-communicable diseases (NCDs). These challenges strain healthcare systems and slow progress toward Universal Health Coverage (UHC). There is a growing need for accessible, food-based nutritional interventions to support prevention, recovery, and long-term health.

Methods: A mixed-method observational study was conducted among 50 participants across diverse age groups. The study included controlled product usage, self-reported outcomes (energy, digestion, general wellness), and basic physiological indicators such as bowel movement frequency and appetite changes. Quantitative data were analyzed descriptively, while qualitative insights assessed user acceptability and feasibility in real-world settings.

Results: Among participants, over 70% reported improved bowel movement regularity within the initial period of use, consistent with increased dietary fiber intake. Approximately 65% reported increased energy levels, while more than half noted improved appetite and general well-being. The product demonstrated high acceptability (>80%), with participants reporting ease of integration into daily diets. These outcomes suggest measurable improvements in digestive function and perceived vitality, particularly among individuals with low dietary diversity.

Conclusion: Whole-food nutritional interventions present a scalable, low-barrier approach to strengthening preventive healthcare within the UHC framework. ARIS SuperFoods may serve as a complementary nutritional support tool in both clinical and community settings. Further controlled clinical studies are recommended to validate long-term outcomes and establish statistical significance.

KEYWORDS: Universal Health Coverage; Nutrition; Whole-Food Intervention; Preventive Health; Malnutrition; Digestive Health; Tanzania; Community Health

OR-TB-12

Screen DM to all TB patients with 35 years or above: Lesson learned to optimizing diabetes mellitus diagnosis in people with tuberculosis in Tanzania

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Background: Tuberculosis (TB) control is threatened by progressive increase of diabetes mellitus (DM), particularly in endemic countries. Screening for DM is not routinely implemented due to limited access diagnostic tools; therefore, we assessed clinical-demographic markers for improving early DM detection in Tanzania setting.

Methods: Our cross-sectional study recruited TB patients received TB treatment between October 2019 to September 2020 at health care facilities in three regions of Tanzania. Patients were screened for DM using DM symptoms (polydipsia, polyphagia and polyuria) and random blood glucose (RBG) testing. Patients with a history of DM and those with no history of DM but an RBG $\geq$ 7.8mmol/L had point-of-care glycated haemoglobin (HbA1c) testing, and were considered to have DM if HbA1c was $\geq$ 48 mmol/mol.

Results: Of 1,344 TB patients, the mean age was 41.0($\pm$ 17.0) years, and 64.7% were male. A total of 1,011 (75.2%) had pulmonary TB, and 133 (10.4%) had at least one DM symptom. Overall, the prevalence of DM was 7.8%, of which 36 (2.8%) TB patients with no history of DM were newly diagnosed with DM by RBG testing. TB/DM patients were older than those with only TB (50.0 $\pm$ 14.0 years vs 40.0 $\pm$ 17.0 years, $p<0.001$). Patients with RBG $\geq$ 7.8mmol/L were more likely to age $\geq$ 35 years ($p=0.018$), with pulmonary TB ($p=0.003$), and have at

least one DM symptom ($p < 0.001$). There was a substantial agreement ($\text{Kappa} = 0.74$) between the on-site glucometer and point-of-care HbA1c tests in detecting DM range of hyperglycemia.

Conclusion: The implementation of clinical-demographic markers and blood glucose screening identified overall prevalence of DM and those at risk of DM in TB patients. These markers are independent predictors for DM range hyperglycaemia and highlight the importance of further diagnostic testing for early co-management of TB and DM epidemics. Keywords: Implementation, DM screening; TB patients; clinical-demographic; Tanzania

OR-TRNSF-02

Non-leukoreduced Red Blood Cells Versus Whole Blood Transfusion: Implications for Cytomegalovirus Reactivation in Sickle Cell Patients

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Background: Sickle Cell Disease (SCD) is a hereditary hemoglobin disorder characterised by the production of hemoglobin S, which leads to anemia and frequent transfusions. Ensuring transfusion safety in low-resource settings remains difficult due to the high prevalence of transfusion-transmissible infections, including cytomegalovirus (CMV). This study aimed to determine whether CMV reactivation in SCD patients is associated with a specific transfusion protocol.

Methods: We performed a cross-sectional study to compare CMV-specific immunoglobulin M (IgM) levels (measured by ELISA) in SCD patients attending two hospitals (Temeke Regional Referral Hospital (TRRH) and Muhimbili National Hospital (MNH)) in Dar es Salaam, which use different transfusion protocols: non-leukoreduced whole blood versus non-leukoreduced red cell component transfusion, respectively. We enrolled 455 SCD patients (310 from MNH and 145 from TRRH) between July 2023 and March 2024. Data were analysed using SPSS version 26, GraphPad Prism v.10.0 and R version 4.5.1.

Results: Prevalence of CMV infection was 91.9%, it increased with age, and females were more affected than males. The IgM titers were significantly higher in patients at TRRH than in those at MNH (Median: 10.59 vs 6.00, $p < 0.0001$), indicating recent CMV infection or reactivation. Additionally, SCD patients who had received non-leukoreduced red blood cell transfusions and had laboratory tests at recruitment showed elevated CMV-specific IgM titers, $p < 0.0001$. The full blood count results from IgM-positive transfused patients at MNH showed a significantly lower Monocyte-to-Lymphocyte Ratio than in IgM-negative patients (median = 0.05 vs 0.11; $p = 0.015$).

Conclusion: The CMV infection or reactivation was more prevalent among patients who received non-leukoreduced whole blood. Our results emphasise the importance of blood component transfusions to enhance transfusion safety and implementing routine CMV monitoring in patients with SCD. Due to multiple transfusion requirements, SCD patients should receive leukoreduced blood products to prevent recurrent CMV infection and or reactivation.

KEYWORDS: Sickle cell disease; blood transfusion; Cytomegalovirus; CMV reactivation; Non-leukoreduced blood component

Delay in Sickle Cell Disease Diagnosis is Associated with a High Prevalence of Cytomegalovirus Infection among Sickle Cell Patients

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Background: Sickle Cell Disease (SCD) is caused by mutations in the β -globin gene, leading to abnormal haemoglobin production, chronic haemolysis, and recurrent anaemia. The SCD prevalence is highest in African countries, and there is no robust SCD newborn screening (NBS) program in many African countries, including Tanzania. Susceptibility to infection is higher among SCD patients due to impaired splenic function and immune dysfunction. Due to multiple transfusions, these patients are at increased risk of acquiring Transfusion Transmissible Infections, including Cytomegalovirus (CMV), which is not screened for, and there is no use of lecoreduced blood in Tanzania. We conducted this study to evaluate the effect of delayed SCD diagnosis on the seroprevalence of CMV infection among SCD patients in a setting with a higher SCD incidence.

Methods: We performed a cross-sectional study at Muhimbili National Hospital and Temeke Regional Referral Hospital. In addition to the oral interview, patients' records were reviewed from their SCD health passport, which documents patients' demographics and clinical information. The CMV-specific immunoglobulin G (IgG) levels (measured by ELISA) were measured in all 455 SCD patients enrolled in the study between July 2023 and March 2024. Statistical analyses were performed using SPSS version 26 and GraphPad Prism v.10.0. A value of $p < 0.05$ was considered significant.

Results: Prevalence of CMV infection was 91.9%, and prevalence increased with age. The mean ($\pm$ SD) age at SCD diagnosis was 48.86 ($\pm$ 43.34), with an age range of 0-288 months. Delay in SCD diagnosis was associated with higher HCMV-specific IgG titers compared to those diagnosed at NBS, $p=0.0320$

Conclusion: We have established that a delay in SCD diagnosis is associated with a higher prevalence of HCMV infection, and we recommend establishing an NBS program to facilitate early SCD diagnosis and intervention.

KEYWORDS: Sickle Cell Disease; Newborn screening; Delayed SCD diagnosis; Cytomegalovirus infection; SCD Patients; Tanzania

Time for Implementation Science Using Superssetting Approach In Fighting Stigma and Discrimination Against People With Sickle Cell Anemia Deserving Donated Blood in Tanzania

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Introduction: Blood Transfusion Service (BTS) is urgent for severely anemic sickle cell anemia (SCA) patients facing life-threatening physiological complications in Tanzania. Sadly, most healthcare facilities (HCFs) face high shortages of safe blood needed for a standard BTS. Low awareness on SCA and the advantages of a voluntary blood donation (VBD) for making the BTS possible remains a healthcare system challenge. Several factors contribute to the noted shortages in the blood banks, including inter alia, a limited public education on SCA,

benefits of VBD, and how stigma and discrimination against SCA patients ultimately lower support for VBD campaign.

Objective: To solicit audiences' views about a study aimed to introduce and field-test an intervention package for raising the level of public members' awareness on the benefits of a VBD and risks of stigmatizing and discriminating against SCA patients, to provide urgently needed support to the VBD campaign.

Methodology: This is a mixed-methods implementation research/science (IR/IS) design, with a supersetting approach involving the targeted stakeholders in opinion-giving and their practical participation in the strategized VBD-oriented intervention.

Results: An official call for a VBD to support all the categories of highly anemic patients registered at formal HCFs in Tanzania is appreciated. The call is openly policy-based, is accompanied by official campaigns and programs targeting enhancement of public awareness and sensitivity on the advocated VBD, with doors and windows left open for all the identified creative or innovative ideas promising translatability into real-world practice in line with the established policy and programs. However, the area of IR/IS nature of studies seems not yet sufficiently covered in relation to a VBD.

Conclusion: The noted IR/IS evidence gap in the area of how an increased community positive response to official calls for practical support of a VBD campaign justifies a need for it to be filled.

KEYWORDS: sickle cell; cost analysis; genetics; burden of disease; employment; Tanzania

OR-TRNSF-05

Addressing the Research Evidence Gap on Financial Cost related to Sickle Cell Disease To Employees and Employers in Tanzania

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Introduction: Sickle cell disease (SCD) is a red blood cell (RBC) disorder inherited from both of one's biological parents. Sickle cell anemia (SCA) is the commonest form of SCD, Tanzania ranked number four in Africa and number five in the world of the countries found leading as homes of high prevalence rates of newborns with it. A severe form of SCA cause acute pain in the chest, in other muscular and skeletal regions, but sometimes, end-organ damages and strokes. Timely and proper diagnosis and case management are essential life-saving interventions. SCA negatively costs both the employees either living with it or their caregivers, financially, and economically. Employers in those sectors also face costs in the mentioned dimensions. Costs are found to be higher when SCA patients suffer end-organ-damages or strokes, involving periods of hospitalization. Regular outpatient visits are also costly. However, the literature available seems dominated by the evidence garnered from the research done outside of Tanzania, implying a gap left in research-based information for the public health policy and program-oriented decisions in that country.

Objective: To develop a research programme focusing on the impact of SCD on employees and their employers in the public and private sector

Methodology: A mixed methods research design and techniques for data collection, analysis and report presentation, targeting employees and employers approached in the mentioned sectors.

Results: The proposed study is likely to generate policy and program relevant evidences, conclusions and recommendations for use by decision-makers at policy and program levels, narrowing the existing research

evidence gap for the benefits of employees living with SCA or those care-giving them and their employers in Tanzania.

Conclusion: A paucity of research in the identified area marks a research gap to fill.

KEYWORDS: sickle cell; cost analysis; genetics; burden of disease; employment; Tanzania

P0-CKD-01

The incidence and risk factors of Chronic Kidney Diseases among people living with HIV attending Care and Treatment Clinic at KCMC hospital Northern Tanzania

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Background: Chronic kidney disease (CKD) remains a leading cause of premature mortality among people living with HIV (PLHIV). In Tanzania, CKD incidence among PLHIV remains variable, with individuals aged ≥ 40 years at higher risk, though current HIV guideline strategies focuses more on elderly above 50years old.

Objective: To determine the five-year incidence and risk factors of CKD among PLHIV attending the KCMC Care and Treatment Clinic (CTC) between 2011 and 2019.

Methods: This was a retrospective cohort of PLHIV who were followed for 5 years. The incidence rate was computed as number of new cases per total person years of follow-up. Logistic regression was used to identified factors associated with CKD reporting adjusted odds ratios (aOR) and 95% confidence intervals (CI), with $p < 0.05$ considered significant

Results: Among 544 participants (70% female, median age 38 years), 52.8% were < 40 years. CKD incidence was 14.5 per 1,000 person-years and increased with age from 7.2 (< 40 years) to 26.6 (≥ 50 years) and male sex. In adjusted analysis, individuals aged 40–49 years had higher odds of CKD (aOR = 3.89, 95% CI: 1.22–9.75). Hypertension (aOR = 4.91, 95% CI: 2.09–11.50), tenofovir use (aOR = 2.21, $p = 0.016$) and poor ART adherence (aOR = 5.14, 95% CI: 2.25–59.95) were also significant predictors.

Conclusion: CKD risk among PLHIV accelerates as early as the fourth decade of life. These findings provide evidence for lowering the "high risk" age cut-off to ≥ 40 years. Incorporating early renal screening, hypertension control, ART adherence and tenofovir stewardship into HIV programs could reduce preventable kidney failure and premature death. These findings underscores the urgency of redefining HIV-CKD screening threshold to age ≥ 40 years.

KEYWORDS: chronic kidney disease; PLHIV; CTC; incidence; risk factors

P0-CANC-02

Pathways and factors associated with breast cancer diagnosis and treatment among women receiving care at KCMC-cancer care centre in northern Tanzania. A cross-sectional study

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Background: This study aimed to investigate the pathways involved in BC diagnosis and treatment and the factors associated with long pathways among BC patients in Northern Tanzania.

Methods: A hospital-based cross-sectional study, involving 252 women diagnosed with BC was conducted from January to August 2024 at the Cancer Care Center (CCC) at Kilimanjaro Christian Medical Center (KCMC). Data were collected via a structured survey. Pathways were defined as the time from first identification of signs or symptoms to seeking healthcare, diagnosis, and initiation of treatment. Then sub-divided in to time one (T1) from first sign or symptoms to seeking healthcare, time two (T2) from seeking healthcare to diagnosis and time three (T3) from diagnosis to treatment. STATA version 17 was used for data analysis. Negative binomial regression was used to analyze social demographics, health system factors, and sociocultural behaviors associated with long pathways.

Results: A total of 252 participants, with a mean age of 56 (± 12.5) years, were enrolled. Overall, 75.8% had long pathways. In T1, 59.2% spent more than three months from symptom onset to seeking healthcare. In T2, 49.6% spent more than 8 weeks to receive their BC diagnosis, and In T3, 29.4% spent more than 4 weeks to start treatment. 63% of the patients diagnosed with advanced BC, with an Inter Quartile Range (IQR) of 132 weeks and a maximum of 1928 weeks. Long pathways were associated with being married (adjusted incidence rate ratio (AIRR)=1.42, $p=0.021$, living in rural areas (AIRR=1.54, $p=0.012$, Misdiagnosis (AIRR 1.99, $p<0.001$), multiple hospital visits (AIRR=2.38, $p=0.008$, visits to traditional healers (AIRR=2.43, $p<0.001$, and ignoring signs and symptoms (AIRR=1.68, $p=0.001$)

Conclusion: The majority of participants had advanced disease and long pathways, which might limit treatment benefits, increasing morbidity and mortality. Health education, knowledge of signs, may help in timely diagnosis.

KEYWORDS: Breast cancer; women; pathways; delayed diagnosis; and associated factors.

PO-CANC-01

The Perspectives of Healthcare Providers, Traditional Healers, and Other Key Informants on the Late Diagnosis of Breast Cancer in Northern Tanzania: A Qualitative Study

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Background: Breast cancer (BC) is the most common cancer among women in Tanzania and contributes substantially to cancer related mortality due to late stage diagnosis and sub optimal treatment. In a context where traditional medicine significantly influences healthcare seeking behavior, understanding the perspectives of both traditional healers (THs) and biomedical healthcare providers (HCPs) is essential to addressing delays in diagnosis and improving outcomes.

Methods: A phenomenological qualitative study was conducted in rural and urban settings of the Kilimanjaro region. Data were collected using six open ended interview questions administered to 20 HCPs (10 doctors and 10 nurses), 10 THs, and 9 key informants (KIs). Additionally, one focus group discussion with 8 THs was conducted. Discussions explored perceptions of delayed diagnosis, patient responses to breast symptoms, and reasons for late presentation. Participants were recruited after working hours. Data were analyzed thematically using NVivo 12 software.

Results: Five main themes explained delays in BC diagnosis: limited knowledge and misconceptions about BC among both HCPs and THs; stigma associated with the disease; high costs and limited access to diagnostic and treatment services; patient related barriers including myths, misperceptions, and spiritual beliefs; and mutual blame between HCPs and THs contributing to ineffective care pathways. Suggested solutions included improving awareness and education, reducing financial barriers, addressing stigma, and fostering collaboration between HCPs and THs.

Conclusion: Late diagnosis of BC in Tanzania is driven by health system, socio cultural, and economic barriers. Efforts to improve early detection should focus on community education, capacity building for both HCPs and THs to enhance early recognition, and reducing financial constraints to care. Strengthening collaboration and establishing referral pathways between traditional and biomedical providers are critical to improving timely diagnosis and patient outcomes. These findings highlight the need for integrated, culturally sensitive interventions that engage communities to improve survival.

KEYWORDS: Healthcare providers; Key informants; Traditional healers; Breast cancer; late diagnosis; Tanzania; Africa

OR-CVD-05

Magnitude and factors associated with adherence to secondary antibiotic prophylaxis in children with rheumatic heart disease at the jakaya kikwete cardiac institute

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Introduction: Rheumatic heart disease (RHD) remains a major cause of morbidity and mortality among children in low- and middle-income countries (LMICs). Secondary antibiotic prophylaxis with intramuscular benzathine penicillin G (BPG) is key to preventing recurrent acute rheumatic fever (ARF) and halting disease progression. However, adherence to this regimen is often suboptimal, reducing its effectiveness.

Objective: To determine the magnitude and factors associated with adherence to secondary antibiotic prophylaxis among children with RHD at the JKCI pediatric clinic.

Methodology: This hospital-based mixed-methods study involved 221 children with RHD on BPG prophylaxis for at least one year. Adherence data were collected through semi-structured surveys with caregiver-child dyads, and adherence was defined as receiving $\geq 80\%$ of scheduled annual injections. Multivariate logistic regression identified predictors of poor adherence. Additionally, eight in-depth interviews (IDIs) with purposively selected participants explored barriers to adherence. Qualitative data were thematically analyzed.

Results: Among the 221 children, 65% had good adherence. Factors significantly associated with poor adherence included living far from the health facility (AOR = 3.4, 95% CI: 1.7–6.86) and absence of a special record-keeping notebook (AOR = 0.56, 95% CI: 0.275–1.12). Common reasons for missed doses included forgetfulness (46.1%), fear of injection pain (16.5%), and lack of knowledge about prophylaxis duration (86.4%). IDIs revealed concerns

about healthcare workers' injection technique competency and the painful nature of BPG.

Conclusion: Adherence to secondary prophylaxis in children with RHD is suboptimal, with several modifiable barriers identified. **RECOMMENDATIONS:** Addressing healthcare system factors, integrating RHD control into national strategies, improving access to health insurance, and implementing routine reminder systems could enhance adherence and improve morbidity and mortality.

KEYWORDS: Non-Communicable Diseases; Injuries; Nutrition; Mental Health; and Co-morbidities

PO-NUTR-01

Dietary diversity scores and exposure to nutrition information among pupils attending public primary schools of Tanzania

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Background: Access to nutrition information is essential for promoting healthy dietary choices, growth, and cognitive development among school-age children and adolescents. Proper nutrition knowledge from family, schools, media, and health professionals can improve dietary behaviors and reduce malnutrition. Dietary diversity (DD), a key indicator of diet quality and nutrient adequacy, is linked to food security, while poor diversity increases malnutrition risk. However, evidence on the relationship between exposure to nutrition information and dietary diversity among pupils in Tanzania is limited. Understanding this relationship can inform targeted nutrition education interventions in schools and communities.

The study aims to assess the association between dietary diversity scores and exposure to nutrition information among pupils of Southern and Southern west highlands zones of Tanzania

Methods: Secondary data analysis was performed for this study using the nationally representative dataset of 2019 School Malaria and Nutrition Survey (SMNS). A cross-sectional study conducted between August and October 2019 in Southern-west and Southern highlands of Tanzania.

Data was analyzed, using STATA version 15 to measure the association between dietary diversity scores and exposure to nutrition information through linear regression analysis.

Results: About one- thirds (3346) 29.9% of students received nutrition information and majority of students (7864) 70.1% had not received nutrition messages. In linear regression model, the results showed that pupils who received nutrition information had lower dietary diversity score ($\beta = -0.072$) as compared to those who did not receive such information

Conclusion: The findings emphasize there is a need to develop strategies for dissemination of nutrition information using appropriate communication channels to reach pupils and communities based on socio-economic status, residence and geographical region.

KEYWORDS: Dietary diversity score; pupils; nutrition; Tanzania

PO-MENT-01

Integrated Mental Health and Psychosocial Support to Improve Workforce and Caregiver Wellbeing at Cardinal Rugambwa Hospital, Tanzania

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1. CARDINAL RUGAMBWA HOSPITAL

Background: Mental health is a critical determinant of both patient safety and healthcare workforce performance. At Cardinal Rugambwa Hospital (CRH), caregivers of children with disabilities and healthcare workers (HCWs) face significant psychosocial stress. This study assessed mental wellbeing using a WHO-aligned

mental wellness index and evaluated the impact of an integrated psychosocial support program over time.

Methods: A mixed-methods quality improvement study using Plan-Do-Study-Act (PDSA) cycles was conducted from July 2025 to March 2026 among 180 participants (80 HCWs, 100 caregivers). Mental wellbeing was categorized as good, moderate, or poor using standardized screening tools. Interventions included peer-support groups, mental health training, burnout management sessions, and lifestyle-based coping strategies. Repeated assessments were conducted in July (baseline), September, December 2025, and March 2026.

Results: At baseline, only (38/80) (47.5%) of HCWs demonstrated good mental wellbeing, with 26.3% moderate (21/80) and 26.3% poor (21/80). Among caregivers, 19% (19/100) had good wellbeing, 11% moderate (11/100), and 70% poor (70/100). By September 2025, slight improvements were observed (HCWs good: 53.8%, caregivers: 24%). In December 2025, substantial progress was noted (HCWs good: 68.8%, caregivers: 36%). By March 2026, further improvement was achieved: HCWs with good wellbeing increased to 76.3%(61/80), while poor mental health reduced to 8.8% (7/80). Among caregivers, good wellbeing rose to 47% (47/100), while poor mental health decreased to 37% (37/100). Despite improvements, challenges remained due to limited resources and inconsistent individual engagement.

Conclusion: Integrated psychosocial interventions significantly improved mental wellbeing among HCWs and caregivers over time, demonstrating that behavioral change is gradual but achievable. Scaling up resources, strengthening continuous engagement, and institutionalizing mental health programs are essential to sustain gains and expand impact.

KEYWORDS: Mental health; workforce resilience; patient safety; quality improvement

PO-MENT-02

Prevalence and correlates of anxiety and depressive symptoms among adults in Tanzania: evidence from a population-based cross-sectional national survey

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Background: Anxiety and depressive disorders are major contributors to the global burden of disease, yet nationally representative evidence from Tanzania remains limited and fragmented. This study estimated the national prevalence and identified correlates of self-reported anxiety and depressive symptoms among adults in Tanzania using population-based data.

Methods: We conducted a secondary data analysis of the 2022-23 Tanzania HIV Impact Survey. Adults aged ≥ 15 years who responded to the mental health items were analysed. Anxiety and depressive symptoms were assessed using the Generalized Anxiety Disorder 2-item (GAD-2) and Patient Health Questionnaire 2-item scale (PHQ-2), respectively, with scores ≥ 3 indicating symptoms. Weighted prevalence was estimated and multivariable logistic regression was used to identify correlates of anxiety and depressive symptoms.

Results: A total of 35,522 and 35,537 participants were included in the analysis for anxiety and depressive symptoms, respectively. The weighted prevalence of depressive symptoms was 4.69% (95% CI: 4.26-5.16%) and anxiety symptoms was 4.3% (95% CI: 3.8-4.8%). The prevalence of this condition increased with age and was higher among females. In the adjusted models, older age (≥ 35 years), female sex, and reporting any chronic health condition were significantly associated with both outcomes. Rural residence was associated with lower odds of depression. Marital status showed protective effects for married/cohabiting adults against anxiety, whereas divorced/separated individuals had an increased risk. Marked regional variation was also observed, with higher odds of both outcomes in the Lake zone and lower odds of anxiety in Zanzibar.

Conclusion: Approximately one in twenty adults in Tanzania reported anxiety or depressive symptoms, with clear demographic and geographic disparities. Integrating routine mental health screening into primary care, especially for women, older adults, and people with chronic conditions is essential. The findings call for targeted strategies to reverse the increasing burden of anxiety and depression in the country.

PO-INJ-03

Trends and predictors of prolonged length of hospital stay among surgically treated orthopaedic trauma patients in a tertiary hospital in northern Tanzania from august 2020 to march 2025

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Background: Injuries are a major global health burden, particularly in low- and middle-income countries (LMICs). Orthopaedic trauma frequently requires surgical care and contributes significantly to hospital admissions. Length of hospital stay (LOS) is a key indicator of healthcare efficiency and quality, yet drivers of prolonged LOS (PLOS) in resource-limited settings remain poorly understood.

Objective: To determine trends and predictors of prolonged LOS among surgically treated orthopaedic trauma patients in Northern Tanzania.

Methods: We conducted a retrospective cohort study using data from the Kilimanjaro Christian Medical Center (KCMC) Clinical Trauma Registry between August 2020 and March 2025. Adult patients undergoing orthopaedic surgery were included. PLOS was defined as LOS above the 75th percentile. Descriptive statistics summarized patient characteristics, and modified Poisson regression identified predictors of PLOS.

Results: A total of 1,465 patients were included; 79.6% were male, with a median age of 36 years (IQR: 26–51). Median LOS was 11 days (IQR: 6–26), with 24.8% experiencing PLOS (>26 days). Health insurance (ARR: 0.70, 95% CI: 0.52–0.94) and upper extremity injuries (ARR: 0.48, 95% CI: 0.30–0.78) were associated with reduced risk of PLOS. Increased risk was associated with moderate and severe injuries, complications, multiple surgeries, thoracic and multiple injuries, and surgery beyond 48 hours.

Conclusion: PLOS is common and increasing among orthopaedic trauma patients. Interventions to improve timely surgical care and expand insurance coverage may reduce hospital stays and improve resource utilization in similar settings.

KEYWORDS: Length of hospital stay; Surgical; Orthopaedic; Trauma; Tanzania

PO-INJ-04

Road Safety Knowledge and Associated Factors Among Commercial Motorcycle Drivers in Tanga City, Tanzania

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Background: The rapid growth in motorcycle use in low- and middle-income countries has contributed to the increasing burden of road traffic injuries and fatalities. In Tanzania, the World Health Organisation estimates a mortality rate of 29 per 100,000 population, with motorcyclists accounting for a significant share of deaths. Commercial motorcycle drivers (CMDs) are particularly vulnerable due to high exposure to traffic risks, informal employment conditions, and limited access to structured safety training. Despite their importance in urban mobility, evidence on their knowledge, attitudes, and practices remains limited. **Aim:** This study assessed the knowledge, attitudes, practices, and compliance with road safety regulations among CMDs in Tanga City, Tanzania, and examined associated socio-demographic and occupational factors.

Methods: A cross-sectional mixed-methods study was conducted among 370 CMDs from 40 registered parking sites. Quantitative data were collected using structured questionnaires to assess knowledge and compliance behaviours. Qualitative data were obtained through two focus group discussions (8–12 participants each) and one in-depth interview with a traffic police officer to explore perceptions, enforcement dynamics, and everyday practices.

Results: Higher education and urban working environments were significant predictors of road safety knowledge. CMDs with at least secondary education were 2.5 times more likely to demonstrate higher knowledge, while those operating in urban areas were three times more likely than their rural counterparts. Qualitative findings showed that many CMDs entered the profession for income, often without formal training or valid licenses. Limited training access and strained relationships with traffic police further hindered compliance.

Conclusion: Education level and workplace context strongly influence road safety knowledge. Limited training and weak institutional engagement contribute to unsafe practices and increased injury risk. Strengthening training programmes, integrating road safety education into curricula, and improving collaboration between police and drivers are essential to enhance compliance and reduce motorcycle-related injuries.

KEYWORDS: Motorcyclists; Road traffic injuries; Road accidents; Tanzania

PO-DM-02

Dietary patterns, diet quality scores and the risk of diabetes: a multi-country study

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6. 9.Trivedi School of Biosciences, Ashoka University, Sonipat, India
7. 5.University Teaching Hospital, Lusaka, Zambia

Background: Dietary patterns are key determinants of non-communicable disease (NCD) risk. Different dietary assessment approaches may capture diet quality differently. Methods include data-driven derived patterns and predefined diet quality scores such as the NCD-Protect and NCD-Risk indices. Evidence comparing agreement between these approaches and their associations with glycemic outcomes in low- and middle-income countries (LMICs) remains limited.

Methods: This cross-sectional analysis used data from the Severe Acute Malnutrition: Role of the Pancreas (SAMPA) study which included 2,251 participants (1,821 adults and 430 children) from cohorts in Tanzania, Zambia, the Philippines, and India. Dietary patterns were derived using principal component analysis (PCA) of food frequency questionnaire (FFQ) data, NCD-Protect and NCD-Risk scores were generated by pragmatically recoding FFQ data to approximate 24-hour dietary recall-based indicators. Agreement between PCA-derived patterns and NCD-Protect/NCD-Risk scores was assessed using Kappa statistics. Associations between dietary

exposures and glycemic markers, plasma glucose at 120 minutes during an oral glucose tolerance test (glucose120) and HbA1c were examined using multivariable linear regression adjusted for age, sex, socioeconomic status, and HIV status.

Results: Fair to very good agreement was observed between PCA-derived dietary patterns and NCD-Protect/NCD-Risk scores across cohorts (kappa 0.21-0.57), indicating overlap in constructs of diet quality. Associations with glycemic markers were inconsistent and cohort-specific. There were also paradoxical associations, including higher glucose120 among Zambian adults classified as having healthier diets. Prior wasting malnutrition did not modify associations between participant characteristics and diabetes, and that demographic, socioeconomic, and clinical factors alone did not explain the observed heterogeneity.

Conclusion: While PCA-derived dietary patterns and global diet quality scores show reasonable agreement, their associations with glycemic outcomes vary across populations and diagnostic measures. These findings highlight the need for context-specific dietary assessment tools and caution against the universal application of diet quality metrics when evaluating metabolic risk in diverse LMIC settings.

KEYWORDS: Dietary patterns; Principal Component Analysis; NCD protect score; NCD risk score

P0-INJ-02

Moderators of the effectiveness of a brief negotiation intervention for harmful alcohol use in injured adults at northern zone referral hospital in Tanzania (2020-2025)

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Background/

Introduction: Harmful alcohol use is a leading driver of injury presentations at emergency departments in sub-Saharan Africa. At Kilimanjaro Christian Medical Centre (KCMC), 30% of injured patients screen positive for harmful alcohol use. The culturally adapted Brief Negotiation Intervention (BNI) was evaluated in the Pragmatic Randomized Controlled Trial (PRACT), yet who benefits most from structured BNI delivery remains unknown.

Methods: Secondary analysis of the PRACT at KCMC Emergency Medicine Department, Moshi, Tanzania (2020–2025). Injured adults with hazardous alcohol use (AUDIT ≥ 8) were randomized to BNI or Usual Care (UC). The primary outcome was binge drinking days at 3-month follow-up. Following intention-to-treat principles, Objective 1 assessed effectiveness of the intervention using descriptive difference-in-difference (DID) analysis, Objective 2 examined moderators using treatment-by-moderator interaction, the Negative Binomial regression methods. Missing outcomes (24.5%) were handled with Multiple Imputation by Chained Equations (MICE, $m=20$).

Results: Among 673 randomized participants (BNI=502, UC=171; 93.6% male; median age 33 years), 508 (75.5%) completed 3-month follow-up. Both arms showed large reductions from baseline: BNI from 3.61 to 0.50 binge days (-86%) and UC from 3.31 to 0.75 days (-77%), overall DID -0.25 days favoring BNI. A baseline imbalance in AUDIT severity (harmful drinkers: UC 21.1% vs BNI 11.2%; $p=0.019$) supported covariate adjustment. Employment type and education level emerged as preliminary effect modifiers. Non-agricultural workers showed greater BNI benefit (DID=-0.87 days) than agricultural workers (DID=-0.17 days). Patients with primary education or less showed markedly greater benefit (DID=-2.61 days) versus secondary-educated patients (DID=+1.20 days).

Conclusion: Both arms benefited from a strong teachable moment effect driven by EMD attendance with BNI group showing greater reduction. Non-agricultural workers and primary-educated patients derived the greatest

differential BNI benefit. Findings support prioritizing BNI for primary-educated patients at KCMC and call for powered moderation trials with employment and education as primary hypotheses.

KEYWORDS: Brief Negotiation Intervention; Alcohol Use Disorder; Emergency Department; Moderation analysis; Tanzania

PO-HSS-08

Integrating People-Centred Strategies for Non-Communicable Disease Management in Tanzania Towards Universal Health Coverage

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Background: As Tanzania advances toward Universal Health Coverage (UHC), the rising burden of non-communicable diseases (NCDs), injuries, mental health conditions, and nutrition-related disorders challenges equitable healthcare access and system sustainability. NCDs—including cardiovascular diseases, diabetes, cancers, and chronic respiratory illnesses—are increasingly prevalent and often co-exist with infectious diseases, necessitating integrated, life-course approaches emphasizing prevention, early detection, and long-term management within people-centred health systems.

Methods: This descriptive and analytical study synthesizes evidence from policy frameworks, literature, and health system practices in Tanzania. Strategies to strengthen NCD services were examined, including health promotion targeting modifiable risk factors (unhealthy diets, physical inactivity, tobacco use, alcohol consumption), community-based screening, task-shifting to primary care providers, and integration of mental health and rehabilitation services. A case study from Kilimanjaro Christian Medical Centre (KCMC) illustrates practical implementation.

Results: Integrated, people-centred approaches improved NCD outcomes. Community-based screening and task-shifting enhanced early detection and access, while mental health and rehabilitation integration improved continuity and quality of care. Digital health innovations and strengthened referral systems supported coordinated delivery. The KCMC case study of a 58-year-old male with hypertension, type 2 diabetes, and post-stroke hemiplegia showed substantial improvement over 12 weeks: Barthel Index increased from 45 to 80, with better glycaemic control and adherence to secondary prevention.

Conclusion: Achieving UHC in Tanzania requires resilient, inclusive, and adaptive health systems addressing NCDs and comorbidities. Investment in integrated, preventive, and patient-centred care models is essential to improve population health and reduce economic burden. Strengthening primary healthcare, expanding community-based interventions, integrating rehabilitation and mental health services, and leveraging digital health technologies are key priorities to support sustainable health system development and Tanzania's long-term health vision.

KEYWORDS: Non-communicable diseases; Universal Health Coverage; Integrated care; Health systems strengthening; Mental health; Lifestyle modification; Tanzania

PO-HTN-01

Hidden Burden of Undiagnosed Hypertension in Malaria-Endemic Tanzania: A Cross-Sectional Study of Adults Screened for Cohort Enrollment

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Background: Tanzania continues to experience a high malaria burden, with an estimated 1.3 million cases annually. Sub-Saharan Africa has undergone an epidemiological shift in malaria endemicity over the last decade,

alongside a rising burden of non-communicable diseases (NCDs). Leveraging baseline data from an ongoing adult malaria cohort, we explored the prevalence of NCDs at the screening stage. This analysis provides insight into the burden of previously undiagnosed conditions among adults assessed for study enrollment and underscores the importance of integrating NCD screening in malaria research settings.

Methods: This prospective cohort study was conducted in Bagamoyo and Chalinze districts, Tanzania, among healthy adults aged 18-55 years across varying malaria transmission settings. Recruitment involved community sensitization, a household census (n=2,477) with GPS mapping, demographic surveys (n=1,802), and clinical screening (n=862), resulting in enrollment of 450 participants. Eligibility criteria included residency, willingness to comply with study procedures, and informed consent. Exclusion criteria included pregnancy, severe malaria, chronic illness, and extreme BMI (<15 or >35). Screening data were analyzed to determine prevalence and causes of exclusion, with emphasis on hypertension and related chronic conditions.

Results: Of the 862 adults screened, 195 (22.6%) were found to have hypertension, making it the leading cause of screen failure. Additional contributors included diabetes and abnormal BMI. Most cases were newly identified during screening, highlighting a significant hidden burden of NCDs in the community.

Conclusion: Incidental findings from malaria cohort screening reveal a high prevalence of undiagnosed hypertension among adults. These results underscore the importance of integrating NCD screening into clinical and research settings, enabling early detection and management while strengthening broader health system surveillance.

KEYWORDS: Hypertension; Malaria-endemic settings; Cross-sectional study

P0-EPLPSY-03

The traditional healer said, 'I had a genie that scared me in my eyes', and that is why I fall": an Ethnographic study about Experiences of people with Epilepsy in Traditional Healing in Mahenge, Tanzania

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Background: Many people with epilepsy in low-income countries use traditional healers as the first line of management following seizure onset. However, their experiences with traditional healing are not well known.

Methods: Ethnographic methods that are culturally specific and focused on oral history, which is contextually rich, were used. A total of 45 oral history interviews with people with epilepsy from 21 villages in Mahenge were conducted. The inclusion criteria were people with epilepsy, aged at least eighteen years, and able to tell their history in Kiswahili, the main language. Data were analyzed manually using the thematic analysis method.

Results: Traditional healers often attribute epilepsy to supernatural causes, such as curses and witchcraft, through receiving the information provided by patients about seizure onset and relating them with phenomena like past experiences or specific events that are believed to have triggered the illness. Along with the treatment, some restrictions were imposed on people with epilepsy that are difficult to fulfil, and these may be used as an excuse for not getting better after the treatment. Physical, emotional and sexual harassment are among the negative practices experienced by patients by the healers.

Conclusion: There is a firm reliance on traditional healing practices for epilepsy, where cultural beliefs and ritual practices jeopardize diagnosis and care for people with epilepsy. Raising awareness about epilepsy and its

management, as well as rights for people with epilepsy among traditional healers and the community in general, is important to improve care and safeguard the interests of patients.

KEYWORDS: Epilepsy; People living with epilepsy; Traditional healing

P0-HSS-07

Assessment of the Afya Msafiri Surveillance System Using COVID-19 as a Case Study at Julius Nyerere International Airport (May 2021-December 2024)

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Background: COVID-19, caused by SARS-CoV-2, emerged in Wuhan, China in December 2019 and rapidly evolved into a global pandemic. Drawing lessons from the pandemic, Tanzania implemented the Afya Msafiri Surveillance System to monitor travellers’ health at official Points of Entry (PoEs). This study evaluated the system’s performance in achieving its intended objectives.

Methodology: The evaluation followed the Centers for Disease Control and Prevention (CDC) Guidelines for Evaluating Public Health Surveillance Systems, assessing usefulness and key attributes including simplicity, flexibility, data quality, acceptability, representativeness, stability, sensitivity, and positive predictive value (PPV). Conducted in March 2025 at Julius Nyerere International Airport (JNIA), the study used retrospective data from May 2021 to December 2024. A total of 50 Port Health staff completed structured questionnaires, while three key informants participated in in-depth interviews. Data collection was complemented by direct observation, system log reviews, and random sampling of surveillance forms.

Results: The system requires travellers to electronically submit health information prior to arrival, which is verified by Port Health Officers and used for real-time risk monitoring. Between May 2021 and December 2024, 12.26 million travellers were screened; 128,602 (10.24%) were tested, and 643 (0.52%) were positive. The system demonstrated good simplicity, flexibility, and timeliness, with 100% of reports submitted within 24 hours. It successfully adapted to emerging threats such as Marburg (2023) and Mpox (2024). However, data quality and acceptability were suboptimal, with completeness at 28.6%, mainly due to restrictive validation rules. Sensitivity and PPV could not be assessed due to evolving testing strategies and lack of standard case definitions.

Conclusion: Afya Msafiri was useful and timely but faced challenges in data completeness. Although no longer primarily used for COVID-19, its evaluation provides important lessons for strengthening surveillance systems in line with the World Health Organization International Health Regulations (2005).

KEYWORDS: COVID-19; Afya Msafiri; Surveillance; Evaluation; Tanzania

P0-EPLPSY-02

Social Impact of Epilepsy: Insights from Mahenge, Tanzania

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Background: Epilepsy is the most common neurological condition worldwide, with the greatest burden borne by low- and middle-income countries. People living with epilepsy (PLWE) often face isolation and discrimination in

their social lives due to negative perceptions of the condition. This study explored the personal challenges experienced by individuals with epilepsy in Mahenge, Tanzania.

Methods: Data were collected from people living with epilepsy (PLWE) through oral history interviews. The study included 45 participants attending the Mahenge epilepsy clinic and was conducted between May 2021 and July 2022. Each interview lasted 45–60 minutes, was audio-recorded, and followed a structured interview guide to capture key themes.

Results: Participants led normal lives before the onset of epilepsy, which profoundly affected them thereafter. The majority of PLWE experienced school dropouts, accidents (such as falling into rivers or fire), and social stigma. Epilepsy was widely believed to be caused by witchcraft, leading most participants to seek treatment from traditional healers. Stigma was a major issue, with participants feeling isolated from relationships, work, and community activities, which impacted their chances of marriage and increased economic difficulties. As a result, many with epilepsy kept their condition hidden to avoid public exposure and rejection. Frequent seizures and resulting injuries led to financial struggles, emotional distress, and social isolation.

Conclusion: Epilepsy is widely perceived as a condition with significant impacts on both individuals and society. It is often attributed to witchcraft, leading many people to initially seek care from traditional healers. Ongoing community awareness programs on epilepsy and its management are essential to improve understanding of the condition, promote appropriate health-seeking behavior, reduce stigma, and enhance quality of life.

KEYWORDS: Epilepsy; Psychological; Stigma; Impact; Mahenge; Qualitative Research

P0-EPLPSY-01

Prevalence of Epilepsy in Dodoma Region, Tanzania

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Background: Epilepsy is one of the most common neurological disorders, affecting approximately 50 million people worldwide, with diverse underlying causes. This study aimed to determine the prevalence and incidence of epilepsy in the Dodoma region of Tanzania.

Methods: A community-based study was conducted between July and October 2025 in six villages in Bahi and Chamwino districts, Dodoma region. Door-to-door household visits were carried out by trained community health workers and data assistants to screen for suspected epilepsy cases using a standardized questionnaire. Individuals identified as suspected cases were subsequently evaluated by a neurologist or trained medical officer for diagnostic confirmation. Descriptive analysis was performed using R software.

Results: A total of 27,429 individuals were screened (median age: 19 years; 51.3% male). Of these, 634 (2.3%) were identified as suspected epilepsy cases and referred for clinical assessment. Overall, 244 individuals were confirmed to have epilepsy, yielding a prevalence of 8.9 per 1,000 population. Among confirmed cases, the median age was 29 years (52.9% female), and the median age at seizure onset was 8 years. Approximately 75% of cases had generalized seizure onset. The epilepsy treatment gap was 65.2%.

Conclusion: This study demonstrates a high prevalence of epilepsy in the surveyed communities of Dodoma region. The substantial treatment gap highlights the need for improved access to diagnosis and care. Further studies are warranted to investigate the underlying causes and inform targeted interventions.

KEYWORDS: epilepsy; prevalence. dodoma; Tanzania

Metformin for prevention of diabetes in people living with HIV and pre-diabetes in Tanzania: a phase III randomized placebo-controlled trial

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Background: Metformin has been shown to delay or reduce the risk of developing type 2 diabetes in high-risk individuals; however, its safety and efficacy among people living with HIV (PLHIV) remain uncertain. Generating robust evidence in this population requires large-scale randomized trials, yet data on the feasibility of conducting such trials in sub-Saharan Africa are limited.

Objective: To assess the feasibility and implementation outcomes (recruitment, retention, and adherence) of a large-scale randomized controlled trial of metformin among people living with HIV in Tanzania.

Methods: Adults with HIV on antiretroviral therapy and pre-diabetes (impaired fasting glucose: ≥ 6.1 to ≤ 6.9 mmol/L or impaired glucose tolerance: 2-hour OGTT ≥ 7.8 to < 11.1 mmol/L) were randomized 1:1 to metformin or placebo using permuted block randomization (block sizes 4, 6, 8). The primary endpoint is incident diabetes defined as 2-hour OGTT ≥ 11.1 mmol/L or two consecutive fasting glucose values ≥ 7.0 mmol/L. Participants are followed for up to 4 years. Adherence is supported through routine counselling and integration with HIV care services.

Results: Between October 2021 and March 2024, 1,691 participants were enrolled despite COVID-19-related disruptions to regulatory processes and HIV service delivery. The median age was 49 years (range 18 - 85), and 74% are female. Retention was high, with attendance rates of 90%, 92%, and 96% at 12, 24, and 36-month visits, respectively. By 2025, only 7.7% of scheduled visits were missed. Median adherence was 94% (range 0 -100%). There were 8 deaths (none related to study medication) and 2% loss to follow-up.

Conclusion: This study demonstrates that large-scale clinical trials among PLHIV in SSA are feasible and can achieve excellent retention and adherence, even in the context of system disruptions. These findings support the capacity to implement complex clinical trials in our setting and inform future diabetes prevention strategies among PLHIV.

KEYWORDS: Metformin; HIV; Pre-diabetes; Diabetes prevention; Diabetes incidence

Pharmaceutical Personnel Contributions in Clinical Trials: Insights from a Vitamin B12 Pharmacokinetic Study in Tanzania

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Background: Pharmaceutical personnel are often perceived primarily as dispensers within healthcare environments such as community and hospital pharmacies, particularly in Low- and Middle-Income Countries (LMICs). However, this perception overlooks their broader expertise in drug formulation, quality assurance, and clinical research. Clinical trials provide a vital platform for pharmaceutical personnel to extend their skills beyond

traditional dispensing roles. This paper presents their contributions to a pharmacokinetic study conducted at the Ifakara Health Institute, which aimed to determine the optimal vitamin B12 dose during pregnancy.

Methods: Pharmaceutical-grade cyanocobalamin was reconstituted in sterilized water following standardized protocols to ensure uniformity. Participants were randomized to receive one of three doses (2.6, 10, or 50 µg), either as single or divided doses. The team ensured randomization accuracy, quality control, and consistency at every stage. Stock solutions were sampled, stored, and later analyzed using an ELISA assay to verify the precision and accuracy of the doses administered.

Results: The study assessed the accuracy and precision of vitamin B12 stock solutions prepared by pharmaceutical personnel using an ELISA assay. Nominal concentrations (2.6 µg/mL, 10 µg/mL, 25 µg/mL, and 50 µg/mL) and their 1:1 dilution were analyzed. Results revealed strong concordance between measured and expected concentrations, with low coefficients of variation (CV), indicating high precision (CV = 0.2% for 25 µg/mL and CV = 0.1% for 50 µg/mL). Minor variability was observed in diluted samples (CV = 12.3% for the 10 µg/mL dilution), although corrected concentrations remained within acceptable ranges. **Lessons and Recommendations:** This study underscores the importance of involving pharmaceutical personnel in pre-administration analysis of investigational products. Their expertise ensures dose integrity, accuracy, and compliance with protocols. Continuous professional training in analytical methods, such as ELISA, and strengthening laboratory infrastructure are essential to enhance clinical trial quality and reinforce confidence in locally conducted research.

PO-INJ-01

Effectiveness of a Culturally Adapted Brief Negotiation Intervention Across Latent Profiles of Risky Alcohol Use Among Trauma Patients in Northern Tanzania (2020-2025)

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Background /

Introduction: Alcohol use contributes substantially to injury-related morbidity and mortality globally, with a high burden in Africa. At Kilimanjaro Christian Medical Centre (KCMC), nearly one-third of trauma patients test positive for alcohol, and alcohol use increases injury risk more than fivefold. Brief interventions such as the Brief Negotiation Intervention (BNI), locally adapted as Punguza Pombe Kwa Afya Yako (PPKAY), have shown effectiveness in reducing harmful drinking. However, alcohol-related behaviours are heterogeneous, and it remains unclear whether intervention effectiveness varies across behavioural subgroups.

Methods: This study is a secondary analysis of the Pragmatic Randomized Adaptive Clinical Trial (PRACT) registry conducted at the KCMC Emergency Department between 2020 and 2025. Adult trauma patients screening positive for alcohol use were randomized to usual care or BNI. Latent Class Analysis (LCA) was conducted using ordered indicators from the Drinker Inventory of Consequences (DrInC) to identify behavioural profiles. Longitudinal mixed-effects models and Difference-in-Differences analyses will assess differential intervention effectiveness across classes using binge drinking days and alcohol consumption at 3 months.

Results: Preliminary findings identified two latent classes: a lower-risk class characterized by minimal alcohol-related consequences and a higher-risk class characterized by frequent impulsive behaviours, including fighting

and loss of control. The higher-risk class was more likely to include younger males with greater alcohol use severity. Ongoing analyses will evaluate whether intervention effectiveness differs across these classes.

Conclusion: These findings highlight the importance of behavioural heterogeneity in alcohol interventions. Tailoring BNI to specific risk profiles may improve effectiveness and optimize resource use in low-resource settings. Further analysis will inform targeted implementation strategies for alcohol harm reduction in Tanzania.

KEYWORDS: Brief Negotiation Intervention; Latent Class Analysis; Risky Alcohol Use Behaviours; Trauma Patients; Tanzania

P0-CVD-01

Designing of a Wearable ECG Machine

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Introduction: Cardiovascular diseases are among the leading causes of death globally and represent a major public health concern in Tanzania contributing to 13% of death. Early detection and continuous monitoring of cardiac activity can significantly reduce complications and improve treatment outcomes. However, existing ECG monitoring systems are often expensive, inaccessible in remote areas, and require trained personnel, limiting their application in low-resource settings.

Methods: The proposed device design includes a wearable, low-cost ECG monitoring system that utilizes chest patch electrodes, an analog front-end ECG amplifier, a heart rate sensor, a microcontroller, IoT and GPS modules. The system is powered by a compact DC supply and transmits real-time data to a mobile app via Wi-Fi and cloud-based IoT platforms. Existing designs and architectures were studied and improved by integrating enhanced signal processing, wireless communication, and data logging features for real-time clinical decision support. Results and Discussion: Simulation and preliminary bench testing demonstrated the feasibility of the proposed design. Compared to conventional systems, the wearable device shows potential for accurate and continuous data acquisition and transmission. The device can send automated messages when cardiac issues are detected that include patient GPS location (Figure 2). The proposed design allows for enhanced accessibility, cost-effectiveness, and real-time ECG monitoring. The anticipated prototype will address data security and privacy, ensuring compliance with medical data regulations.

Conclusion: The device aims to improve early detection and healthcare accessibility, especially in resource-limited settings. Future work will involve developing a functional prototype, validating the system through clinical trials, and ensuring data security for real-world applications.

OR-DIG-07

Feasibility and acceptability of digital application technology in enhancing knowledge and self-care management of type 1 diabetes mellitus among adolescents and young adults in dar-es-salaam, Tanzania.

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Background: Type 1 diabetes Mellitus (T1DM) management among adolescents and young adults in Tanzania faces significant challenges, with mortality rates reaching 25% within five years of diagnosis. Despite Tanzania's 99% mobile phone penetration, digital health applications' potential for enhancing diabetes self-care remains unexplored.

Objective: To assess feasibility and acceptability of digital application technology for enhancing knowledge and self-care management of T1DM among adolescents and young adults aged 12-25 years in Dar es Salaam,

Tanzania.

Methods: This Quantitative method study will recruit 145 participants with T1DM from Mwananyamala and Temeke Regional Referral Hospitals using purposive sampling. Data collection employs validated instruments including Technology Acceptance Model (TAM) questionnaire, mHealth App Usability Questionnaire (MAUQ), and barriers assessment questionnaire. Focus group discussions and interviews will complement quantitative findings. Analysis will use SPSS version 27 and thematic analysis. Expected Outcomes: The study will determine mobile device ownership prevalence, technology acceptance levels, preferred app functionalities, and implementation barriers. Findings will inform development of culturally appropriate digital health solutions.

Conclusion: This research addresses knowledge gaps in digital health adoption for chronic disease management in Sub-Saharan Africa. Results will guide policymakers and developers in creating scalable mHealth interventions to improve diabetes self-management among vulnerable youth populations.

KEYWORDS: Non-Communicable Diseases; Injuries; Nutrition; MentalHealth; and Co-morbidities

OR-EPLPSY-02

Caregivers' readiness to attend epilepsy clinic for their children and associated factors in Ifakara, Tanzania: An exploratory qualitative study

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Introduction: Epilepsy is a common neurological disorder impacting children globally, with timely diagnosis and treatment being essential for optimal health outcomes. However, sub-optimal clinic attendance among children living with epilepsy, particularly in resource-limited settings like Tanzania, presents a significant challenge to effective care. This study explored caregivers' readiness to attend epilepsy clinics for their children and the factors influencing this readiness in Ifakara, Tanzania.

Methods: This exploratory qualitative study used in-depth interviews with caregivers of children living with epilepsy in Ifakara, Tanzania. Participants were purposively selected to gather diverse perspectives and experiences. Data collection continued until thematic saturation was achieved, resulting in 12 comprehensive interviews. Inductive thematic analysis was employed to systematically identify, analyze, and report patterns and themes within the transcribed data.

Results: The study included 12 caregivers, predominantly mothers, with varying educational and employment backgrounds. Five key themes emerged that illustrate the complex factors shaping caregivers' readiness: emotional and social impact of epilepsy (e.g., fear, stigma, isolation); perceived benefits and challenges of clinic services (e.g., trust in healthcare providers, long wait times, medication availability); socioeconomic barriers (e.g., financial constraints, transportation difficulties); the crucial role of social support from family and community; and the impact of knowledge and awareness on engagement with care.

Conclusion: This study reveals that caregivers' readiness to attend epilepsy clinics for their children in Ifakara is influenced by a nuanced interplay of emotional, social, logistical, and economic factors. The findings underscore the critical need for multifaceted, context-specific interventions that address epilepsy-related stigma, improve accessibility and affordability of healthcare services, enhance caregiver knowledge, and strengthen community support networks to optimize care for children living with epilepsy in similar resource-constrained environments. Keywords: Epilepsy, Caregivers, Children living with epilepsy, Clinic attendance, Readiness, Qualitative, Ifakara, Tanzania

KEYWORDS: Non-Communicable Diseases; Injuries; Nutrition; MentalHealth; and Co-morbidities

Cascade of care for diabetes mellitus in Tanzania: from screening those at risk to achieving glycaemic control among adults attending referral hospitals

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Background: Sub-Saharan Africa is witnessing a rapid increase in diabetes mellitus (DM) prevalence, but substantial yet uncertain gaps exist for screening and care.

Methods: We estimated losses across the diabetes care cascade in Tanzania including up to 400 adults from two hospitals across five stages: screening, diagnosis, enrolment in care, treatment, and glycaemic control, with separate cascades for hypertension and dyslipidaemia and logistic regression analysis to identify factors associated with losses across the cascade.

Results: A total of 1,437 participants within four cohorts (median ages 57-63; 64.0-65.3% female) were included. Of at-risk individuals, 47.5% were screened, and 8.3% were diagnosed with DM. Of those diagnosed with DM, 73.0% were linked to care and initiated treatment, 36.1% had a recent blood glucose test and 6.2% achieved glycaemic control. Among those in DM care, 75.5% were known hypertensive, of whom 74.0% were treated and 25.3% had blood pressure controlled. Similarly, 28.8% had known dyslipidaemia, of whom 27.0% were treated and 14.3% achieved LDL control. Lower education was associated with lower screening uptake; lack of health insurance and greater travel distance with lower linkage to care; and younger age with worse glycaemic control.

Conclusion: Substantial losses exist across the diabetes care cascade in Tanzania, and for cardiovascular risk management among those in DM care. Targeted solutions are required to improve diabetes screening and care in Tanzania.

KEYWORDS: Diabetes Mellitus; Cascade of care; Tanzania

One Health and Climate Resilience: Mitigating Emerging and Re-emerging Disease Threats

19 Abstract(s)

OR-AMR-09

Understanding Contexts of Antimicrobial Use for Targeted Interventions: A Mixed-Methods Study of Knowledge, Practices, and Structural Drivers of Antimicrobial Resistance in Northern Tanzania

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Background: Antimicrobial resistance (AMR) is a quintessential One Health challenge, in which the spillover of resistant pathogens among livestock, humans, and the environment threatens global biosecurity. In Tanzania's agro-pastoral systems, the lack of integrated surveillance and diagnostic infrastructure necessitates a ground-level understanding of the sociocultural drivers of antimicrobial use (AMU) to safeguard both animal welfare and public health.

Objectives: The study explored the Knowledge, attitudes, and practices (KAP) regarding AMU/AMR among agro-pastoralists in Arumeru District, northern Tanzania, to identify targets for behavioural change interventions to control AMR.

Methods: A mixed-methods exploratory study was conducted in Arumeru District. Qualitative data were gathered through 14 focus groups and key informant interviews with livestock keepers, health professionals, and elders to map local disease etiologies and veterinary drug-use practices. These findings informed a quantitative KAP survey of 151 households.

Results: Qualitative evidence revealed a "crisis of expertise," where diagnostic "guesswork" and the conflation of AMR with "fake drugs", non-completion, and underdosing with veterinary drugs predominated. Quantitatively, 69% of households reported using anthelmintics (e.g., Albendazole), while the most common antibiotic, Oxytetracycline (OTC 30), was reported by 20.8% of households. Usage was frequent, with 64.2% of respondents administering drugs 1–2 times per month. Notably, 30–50% of participants bypassed veterinary professionals, seeking advice from unregulated agrovets or family. Systematic economic pressures to ignore withdrawal periods further drive sub-optimal practices, facilitating the entry of residues into the food chain.

Conclusion: AMR in Arumeru is driven by systemic resource scarcity rather than mere lack of awareness. To be effective, One Health interventions must move beyond education to address the political economy of livestock health. Recommendations include establishing community-based diagnostic hubs and incentivising professional veterinary consultation to facilitate overall disease management for better treatment outcomes.

KEYWORDS: Antimicrobial use; Antimicrobial Resistance; One Health; Agro-pastoral systems, Tanzania

Response and lessons learned from Marburg Virus Disease outbreaks in Africa: A Systematic Review

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Background: Marburg virus disease (MVD) is a highly virulent haemorrhagic fever caused by the Marburg virus, with recurrent outbreaks across Africa associated with high case fatality rates (CFRs). Despite decades of outbreaks, comprehensive evidence on response strategies and lessons learned remains dispersed. This systematic review synthesises available evidence on outbreak response, public health interventions, and lessons learned from MVD outbreaks in Africa from 1975 to 2025.

Methods: A systematic search was conducted in multiple databases to identify studies reporting MVD outbreaks and response measures in Africa. Studies were screened and data extracted on outbreak epidemiology, transmission dynamics, clinical and public health responses, community engagement, lessons learned, challenges, and policy implications. Descriptive synthesis was conducted using the thematic areas identified.

Results: Twenty-three studies met the inclusion criteria, spanning outbreaks in Uganda, Tanzania, Rwanda, Angola, Ghana, Equatorial Guinea, Kenya, and DRC. Outbreaks ranged from isolated cases to large epidemics, with CFRs between 21% and 100%. Key response strategies included rapid case detection, isolation, contact tracing, infection prevention and control (IPC), risk communication, and coordinated multisectoral interventions. Community engagement with local leaders and health workers enhanced compliance with public health measures. Persistent challenges included delayed outbreak recognition, limited laboratory capacity, weak surveillance, and socio-cultural barriers. Lessons learned emphasise the importance of early detection, strengthened IPC, healthcare worker protection, community engagement, and coordinated national and international response systems. Policy implications highlight the need for robust surveillance, rapid response teams, laboratory capacity, culturally sensitive risk communication, and regional collaboration to improve preparedness and mitigate future outbreaks.

Conclusion: Effective MVD outbreak response depends on integrated approaches combining robust surveillance, strong infection prevention and control, timely diagnostics, coordinated multisectoral action, and meaningful community engagement. Strengthening health system preparedness, enhancing laboratory capacity, and incorporating culturally sensitive communication strategies are critical for improving outbreak response and resilience in Africa.

KEYWORDS: Marburg Virus Disease; outbreak response; lessons learned; Africa

Epidemiological patterns and Determinants of Cholera positivity in Mwanza region ,Tanzania: January 2024- June 2025

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Background: Cholera remains a persistent public health challenge in Tanzania, driven by unsafe water, poor sanitation, and high population density. Mwanza Region has experienced sustained transmission since early 2024, reporting over 1,300 cases and 49 deaths (CFR 3.7%) by June 2025. This study analyzed surveillance data to

describe epidemiological patterns and determinants of cholera positivity.

Methods: An analytical cross-sectional study was conducted using Ministry of Health line-list data of 455 rapid diagnostic test (RDT)-tested cases from January 2024 to June 2025 across eight councils in Mwanza. Descriptive statistics summarized person place time distribution. Modified Poisson regression (log link, robust variance) estimated adjusted prevalence ratios (APRs) for factors associated with RDT positivity.

Results: Of 455 cases, 53.2% were male, 63.7% were aged 20–54 years, and 53.9% were peasants. Primary water sources were lake/river (39.4%) and tap water (38.2%). Magu District contributed the highest proportion of RDT-positive cases (26.4%). School-aged children and adolescents (5–19 years) were more likely to test positive than under-fives (APR 1.26; 95% CI: 1.03–1.53). Use of tap water (APR 1.17; 95% CI: 1.02–1.35) and shallow wells (APR 1.28; 95% CI: 1.10–1.50) was associated with higher positivity compared to deep wells. Among the eight councils analyzed, residence in Sengerema District Council was protective, with significantly lower cholera positivity compared to Buchosa District Council (APR 0.30; 95% CI: 0.14–0.61).

Conclusion: Cholera positivity was highly associated with age, water source, and area of residence. Targeted WASH interventions should be prioritized in identified high-burden councils, focusing on households using tap and shallow well water through routine water quality assessment, chlorination, and promotion of safe water storage practices. In addition, school aged children and adolescent-focused hygiene education initiatives should be strengthened to address their increased risk. These combined, data-driven interventions are essential to interrupt transmission and sustain progress toward cholera elimination.

KEYWORDS: Epidemiological Patterns; Determinants; Cholera; Mwanza

OR-CLIM-01

Flood Exposure and Disruption of Geographic Access to Essential Health Services in Tanzania

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Background: Floods are among the most damaging natural disasters globally, posing significant risks to infrastructure, public health, and health systems. In Tanzania, floods account for approximately 70% of natural disasters, yet limited evidence exists on how flooding affects both the location of health facilities and access to care. This study assessed flood exposure of essential health facilities and examined the potential impact of flooding on geographic accessibility to health services in Tanzania.

Methods: Essential health facilities providing critical services were compiled, geolocated, and quality controlled. Flood hazard data from the Joint Research Centre (JRC) Global Flood Awareness System (GloFAS) 10-year return period scenario was used to identify facilities located within or near flood-prone areas and to assess inundation extent. Catchment populations were estimated to quantify populations potentially affected by flood-exposed facilities. To evaluate functional access, a travel-time accessibility model was implemented using a routing engine to compare access to health facilities under baseline and flood conditions.

Results: Approximately 11% (1,096) of health facilities were located within or near flood-prone areas. Of these, the majority were publicly owned (76%) and primary-level facilities (70%). A total of 84 facilities were directly inundated, potentially affecting approximately 950,000 people reliant on these services. Regions with the highest proportion of populations at risk included Morogoro and Tanga. Preliminary accessibility findings indicate that

flooding reduces accessibility coverage by increasing travel times to the nearest functional facility and shifting some populations beyond commonly used travel thresholds. Early spatial patterns suggest the greatest accessibility losses occur in flood-prone coastal areas, including Pwani, and parts of northern Tanzania.

Conclusion: Flood exposure threatens both the functionality of health facilities and physical access to care. Integrating flood risk into health system planning, infrastructure investment, and emergency preparedness is critical to strengthen climate-resilient service delivery and safeguard access during extreme events.

KEYWORDS: Flood Hazards; Heath facility; Access to care; Travel times

OR-CLIM-02

Assessing the association between drought exposure and quality of life among people living in drought prone areas VS non-drought prone areas: The CLIMATCH study

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Introduction: Drought exposure may be associated with poor quality of life (QoL) in social, psychological, physical, and health domains particularly in people with chronic diseases. However, data are limited in sub-Saharan (SSA). This study aimed to assess the links between drought exposure, diabetes and hypertension and QoL in Tanzania.

Methods: We conducted a cross-sectional study drought prone areas (Same, Meatu, Chamwino and Bahi) and non-drought prone areas (Kibondo, Uvinza, Nkasi, and Biharamulo) to assess the association between drought exposure and QoL between August, 2024-November, 2025. Data on demography, socio-economic status, food insecurity, diabetes and hypertension were collected as co-variables. QoL was assessed using physical, psychological, social, and environmental domains. We used multi linear regression to assess the association between drought exposure, co-variables and QoL.

Results: Of the 2874 participants, 1460 were living in drought-prone areas, 1414 were living in non-drought prone areas. The mean age was 47 (SD 15.4) and 62% were females. Participants living in non-drought prone areas had higher physical (58.15 SD ±12.3 vs 56.21±12.53) , social (61.65 SD ±15.53 vs 60.14 ±15.62), psychological (65±13.76 vs 63.04 ± 13.92), and environmental (49.50±14.78 vs 46.04 ±13.52) mean scores compared to those in drought prone areas. Food insecurity and, socioeconomic status were associated with poor QoL in all domains among people in drought areas but not in non-drought prone. Older age was associated with poor QoL in physical domain in drought prone areas but diabetes and hypertension were not associated with QoL in all domains.

Conclusion: People living in drought prone areas had poor quality of life compared to people living in non-drought areas. Food security and SES were associated with QoL but diabetes and hypertension were not associated. Findings from this study will be used to inform strategies to improve QoL among people living in drought areas.

KEYWORDS: drought; quality of life (QOL); non-drought

OR-CLIM-03

The intersection of climate change and chronic diseases. . A narrative review

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Background: Climate change is a threat to global health currently. The links between climate hazards and infectious diseases or acute injuries are well-documented, however the impact on non-communicable diseases

(NCDs), including cardiovascular disease, respiratory illness, diabetes, and mental health disorders are unexplored in synthesized form. Existing literature is of a narrow scope, focusing on air pollution only or heat or a prediction of extreme weather events from 2020 to 2025. However, no comprehensive study or review has systematically integrated socioeconomic, physiological and healthcare-infrastructure pathways through which climate change worsens NCDs.

Methods: Analyzing peer-reviewed literature from 2020 to 2025. PubMed, Web of Science, and Google Scholar were searched using the following key terms, "climate change," "global warming," "chronic disease," "non-communicable disease," "cardiovascular," "respiratory disease," "diabetes," "air pollution," and "mental health." Studies were included if they explored the epidemiological, physiological, or socioeconomic links between climate-related hazards (e.g., flooding, air pollution, heatwaves, wildfires) and the pathogenesis, progression, or management of major chronic diseases. From each included study we extracted key findings related to the relationship between climate hazards and NCD outcomes.

Results: The search produced 850 unique records. After a thorough title/abstract screening and full-text review against the inclusion criteria, 100 studies were included in the thematic synthesis. The findings reveal interconnected pathways of impact: direct physiological effects from extreme heat and air pollution (e.g., exacerbating asthma, Chronic Obstructive Pulmonary Disease (COPD), and cardiovascular failure); indirect effects via altered vector ecology and increased allergens; disruption of healthcare infrastructure and supply chains by extreme weather events; and profound psychosocial impacts, including trauma and eco-anxiety, which worsen metabolic and mental health outcomes.

Conclusion: The review concludes that climate hazards are undermining decades of progress in NCD prevention and management, creating a critical public health disaster. Addressing this challenge requires integrated solutions.

KEYWORDS: climate change; global warming; chronic diseases; non-communicable diseases; respiratory diseases

OR-CLIM-05

Influence of Indoor Microclimate on Anopheles funestus Resting Patterns in South-eastern Tanzania

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Background: Indoor resting patterns of malaria vectors are changing, potentially driven by evolving housing designs (roofing materials and wall construction) and associated indoor thermal and humidity-steered microclimates. This study quantifies how microclimatic gradients shape the resting choices of Anopheles funestus in southeastern Tanzania, testing whether lowermost, mid-wall, and uppermost indoor zones create distinct thermal and humidity niches that drive mosquito site selection.

Methods: Between November 2024 and January 2026, twelve sentinel houses were sampled three times a week. In each house, mosquitoes were collected from lowermost, wall-midsection and uppermost indoor zones using Prokopack aspirators. Mosquitoes were morphologically identified using standard taxonomic keys, and Anopheles funestus were included in the analysis. Indoor temperature and relative humidity were recorded at 30-minute intervals. Associations between microclimate and resting behavior were analyzed using mixed-effect models.

Results: Across 153 sampling days, 1,910 An. funestus were collected; 40% rested on lowermost surfaces. Uppermost sections had significantly fewer mosquitoes (aIRR = 0.40, CI: 0.31-0.51, p < 0.001). Metal-roofed and mud-walled houses had lower mosquito abundance than grass-thatched and brick-walled (p < 0.001). Indoor

thermal microhabitats matched mosquito resting preference, for instance, uppermost surface, mosquito least preferred being the warmest compared to lowermost ($p < 0.001$; Cohen's $d = 0.72$ °C). Although, predicted mosquito abundance peaked jointly at temperatures of 32 °C and absolute humidity of 17 g/m³, increased temperature fluctuation steered reduced abundance.

Conclusion: Resting patterns of *An. funestus* were influenced by indoor microclimates, which are in turn shaped by house characteristics, particularly roof and wall materials. This highlights the importance of fine-scale microclimate dynamics on vector ecology and control strategies. For example, spatially targeted IRS, guided by species-specific resting behavior could improve intervention efficiency while reducing insecticide use and operational costs.

KEYWORDS: Resting patterns; Indoor microclimates; *Anopheles funestus*; South-eastern Tanzania

OR-CLIM-06

Effect of Climate and El Niño on Aedes Larvae Abundance from 2021 to 2023 in Tanga and Unguja Sites, Tanzania

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Background: Dengue, transmitted by *Aedes* mosquitoes, remains a significant public health concern both globally and within Tanzania. Weather conditions influence *Aedes* vector abundance and dengue transmission risk. This study aims to quantify the impact of weather variability on *Aedes* larval abundance at six sites in Tanga and Unguja, Tanzania.

Methods: Monthly collections of *Aedes* larval abundance were conducted at each site from October/November 2021 to September/December 2023 in Tanga and Unguja. Larval collections were conducted monthly from fixed breeding sites using dippers and pipettes, with containers categorized by type and positivity recorded. Weather variables, including rainfall, temperature, relative humidity and the Oceanic Niño Index (ONI), were acquired from satellite databases. A distributed lag non-linear model was employed to estimate the overall relationships between weather, ONI, and *Aedes* larvae abundance.

Results: Between October 2021 and December 2023, a total of 33,869 *Aedes* larvae were collected from Tanga sites and 9,047 from Unguja sites. The majority of larvae in Tanga were found in discarded tyres, while in Unguja, most were collected from discarded tins. Increased monthly cumulative rainfall above 200 mm at a lag of 0 months, mean temperatures exceeding 28.5°C at a lag of 1–2 months, and El Niño conditions (ONI >0.5) at a lag of 6 months were all associated with higher *Aedes* larvae abundance in both regions. The associations between rainfall and temperature were relatively consistent across different sites.

Conclusion: Both temperature and ONI are potential predictors of vector activity with a lead time of 1–6 months, while rainfall can indicate the magnitude of vector prevalence within the same month. This information, together with knowledge of breeding site distribution, is valuable for spatial risk prediction and the implementation of effective Aedes control interventions.

KEYWORDS: Aedes; Dengue; Lag non-linear model; Oceanic Niño Index

OR-NTD-23

Sustainment Status of Community-Based Health Education Delivery to Control Taenia solium Infection in Selected Districts of Tanzania: An Implementation Research.

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Background: Despite the proven effectiveness of health education interventions (HEIs) in addressing Taenia solium infections, their sustained delivery remains a challenge. This study was conducted to determine the sustainment status of HEI delivery in selected districts of Tanzania.

Methods: A cross-sectional study was conducted from December 2024 to June 2025 in Kongwa, Mbulu, Mbinga, and Songwe districts, using the Sustainment Measurement System Scale (SMSS), which comprises a global sustainment outcome (GSO) and seven sustainment determinants (SDs). Composite scores (CS) of the GSO and SDs were used to determine the extent and determinants of HEI delivery sustainment, respectively. Internal consistency of the SMSS subscales was assessed using composite reliability (CR). Based on the class interval the CS falls into, the GSO and SDs were considered: very low (1.00 - 1.80), low (1.81 - 2.61), moderate (2.62 - 3.42), high (3.43 - 4.23), or very high (4.24 - 5.04).

Results: In total, 485 respondents were interviewed. The CR was 0.742 for GSO, while ranging from 0.616 to 0.885 for SDs. The GSO for HEI delivery was low (CS = 2.58), with differences across districts, F (3,142) = 22.998, p < 0.001. Responsiveness to community needs and values were the two SDs with high CS (4.08 and 4.06, respectively), whereas financial support scored the least (1.19). In addition, SDs were weakly to moderately correlated with GSO (r = 0.17 to 0.47).

Conclusion: The sustainment level of HE delivery for controlling PTIs was low across the studied districts. Further, the seven SDs did not fully influence HE delivery sustainment, suggesting that additional contextual factors were influencing HE delivery sustainment. Future research should explore these contextual determinants to inform strategies for improving HE delivery sustainment.

KEYWORDS: Health education; Taenia solium infections; implementation research; Delivery sustainment

OR-NTD-25

Mapping of Taenia solium taeniasis and cysticercosis in Tanzania

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Introduction: *Taenia solium* taeniasis and cysticercosis is a global public health problem. Despite its known socio-economic impact, no major control programmes exist. The current study was undertaken to map the distribution of *T. solium* taeniasis and cysticercosis in Tanzania, identify areas at the highest risk of infection and the major risk factors for acquiring the infection.

Methodology: This mapping survey was implemented in all administrative districts of Tanzania mainland and Zanzibar based on systematic desk review of published and unpublished literature, animal and human health facility records and administration of questionnaires to district veterinary and medical officers. Information collected was inputted into the WHO *T. solium* mapping tool to identify and classify areas endemic for *T. solium* taeniasis and cysticercosis and aggregated into *T. solium* taeniasis and cysticercosis distribution maps. Findings: Findings indicated that *T. solium* taeniasis and cysticercosis is highly endemic in mainland Tanzania. A total of 67 districts or 36.4% of all 184 districts reported *T. solium* taeniasis and cysticercosis cases in humans or pigs or both. *T. solium* taeniasis and cysticercosis was not reported in Zanzibar. The observed distribution of *T. solium* taeniasis and cysticercosis in pigs and humans was consistent with the distribution and density of free roaming pigs whereby higher concentration of cases was reported in the Northern regions of Arusha, Manyara and Kilimanjaro, the central regions of Dodoma and Singida and in the Southern regions of Iringa, Njombe, Mbeya, Songwe and Ruvuma. Cases were also reported and in Tabora, Katavi, Kigoma, Kagera, Geita and Mwanza regions.

Conclusion: The current mapping survey indicated that *T. solium* taeniasis and cysticercosis is highly endemic in mainland Tanzania but not endemic in Zanzibar. Integrated interventions are recommended for control and elimination of *T. solium* taeniasis and cysticercosis in highly endemic districts using the One Health approach.

OR-OH-03

Operationalizing One-Health for Community Pandemic Preparedness and Response: A Scoping Review from East-African Community

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Background: While community-level systems play a central role in epidemic preparedness, response, and recovery, there is limited evidence on how the One-Health approach is implemented at this level across East African Community (EAC) countries. Despite growing recognition of the interconnected drivers of emerging and re-emerging infectious diseases, surveillance systems remain siloed, and early warning signals from animal and environmental sources are rarely integrated into public health decision-making. This gap leads to delayed outbreak detection, inefficient response coordination, and missed opportunities for prevention, ultimately undermining resilience to public health threats and reduces the effectiveness of pandemic preparedness and response efforts. This review aimed to assess how the One-Health approach is operationalized within community-level outbreak preparedness systems, using the EAC as a case example.

Methods: We searched peer-reviewed databases for studies examining outbreak preparedness and response in EAC countries, with no restriction on publication year. Eligible studies were screened using predefined criteria and synthesized through a One-Health framework, with findings mapped onto the 21 components of the Resilience in Public Health Emergency Preparedness model. Of the 1,047 records identified, 43 publications were included in the final analysis.

Results: Most studies were descriptive or cross-sectional, with limited evaluation of sustainability, financing mechanisms, or institutional learning. Risk communication and community engagement were commonly reported, whereas legislative preparedness, climate and environmental integration, and formal evaluation systems were rarely addressed. Cross-sectoral coordination tended to improve during crises but remained weakly institutionalized and heavily dependent on external funding. Vulnerabilities were disproportionately concentrated among rural communities, populations living near wildlife, and socioeconomically marginalized groups. Overall, community-level outbreak preparedness in EAC countries remains largely reactive and fragmented.

Conclusion: Strengthening One-Health resilience will require institutionalized governance, domestic financing, integrated surveillance systems, and climate-informed planning that extends beyond emergency response cycles.

KEYWORDS: One Health; outbreak preparedness; pandemic preparedness; public health emergency; East African Community

OR-OH-04

One Health Approach to Predicting, Detecting and Responding to Biosecurity Outbreaks in the East African Community: A Scoping Review

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Background: Infectious diseases of biosecurity concern are increasing in frequency, diversity, and recurrence across Africa. The East African Community (EAC) countries are particularly vulnerable to recurrent outbreaks, and the region is increasingly recognised as a hotspot of pathogens with epidemic and pandemic potential. We aimed to systematically map existing evidence and identify the tools, technologies, and strategies employed for the prediction, detection, and response to emerging and re-emerging infectious diseases within a One-Health framework.

Methods: We conducted a comprehensive review of peer-reviewed literature and credible grey sources identified through online databases, without restriction on publication year. The analysis focused on EAC member states: Burundi, Democratic Republic of the Congo, Kenya, Rwanda, Somalia, South Sudan, Tanzania, and Uganda. Evidence was synthesized to assess capacities for outbreak prediction, detection, and response, and their alignment with One-Health principles. **Findings:** The EAC region demonstrate elements of prediction, detection, and response systems for infectious diseases with pandemic potential, increasingly framed within One-Health approaches. However, capacities were unevenly distributed across member states and remain largely concentrated on a limited set of priority pathogens. Predictive systems predominantly relied on conventional epidemiological methods, while diagnostic capacity was constrained by limited integration of genomic surveillance and next-generation platforms. Clinical management strategies depend mainly on supportive therapies, with restricted local capacity for development and deployment of novel diagnostics, vaccines, and therapeutics. **Interpretation:** Strengthening regional biosecurity requires institutionalizing advanced predictive analytics, expanding genomic surveillance, and scaling up next-generation diagnostic platforms within integrated One-Health systems that link human, animal, and environmental surveillance. Investments in clinical and translational research infrastructure are essential to support the development, local validation, and equitable deployment of context-specific countermeasures, thereby enhancing early warning, risk assessment, and

KEYWORDS: Pandemic; Outbreak; Prediction; Detection; Response; East Africa

OR-OH-05

Fasciolosis and Indigestible Foreign Bodies in Cattle Slaughtered at Uvinza Slaughter Slab, Kigoma Region: Local Evidence for One Health Action

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Background: Fasciolosis and indigestible foreign bodies (IFBs) are major causes of organ condemnation and reduced carcass quality in Tanzanian slaughter facilities, highlighting persistent challenges in livestock health management, pasture hygiene, and waste management. These conditions pose significant food safety and environmental risks.

Methods: A cross-sectional study was conducted at Uvinza Slaughter Slab from March to September 2025 to determine the prevalence and associated risk factors for fasciolosis and IFBs. Postmortem examination of cattle assessed liver pathology and forestomach contents. Data on animal demographics, grazing system, source, presence and type of IFBs, anatomical location, and reasons for liver rejection were collected. Descriptive statistics, Chi-Square tests, and logistic regression analyses were performed using R software.

Results: A total of 436 cattle were examined. The overall prevalence of liver rejection was 14.7% (95% CI: 11.5-18.3), mainly due to *Fasciola* spp. infestation, and of IFBs was 4.4% (95% CI: 2.8-7.0), dominated by plastic bags and clothing materials. Cattle aged above six years were 2.10 times more likely to have liver rejection (OR = 2.10; 95% CI: 1.17-3.93; $p = 0.021$). Animals with good (OR = 0.14; 95% CI: 0.04-0.37; $p < 0.001$) and moderate (OR = 0.38; 95% CI: 0.19-0.79; $p < 0.001$) body condition had significantly lower odds compared to those with poor condition. No significant predictors were identified for IFBs.

Conclusion: Fasciolosis and IFBs remain major causes of liver condemnation, economic loss, and food safety risks in Uvinza. Strengthened community engagement, participatory programs and extension systems on deworming and waste management under a One Health framework are essential for effective control.

OR-OH-06

Climate-Sensitive Zoonotic Trematodes: A One Health Perspective on Schistosomiasis and Fascioliasis in Tanzania

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Background: Climate change is increasingly altering the transmission dynamics of snail-borne zoonotic diseases. Trematode infections such as schistosomiasis and fascioliasis are highly sensitive to environmental conditions that affect freshwater snails, intermediate hosts. In Tanzania, overlapping human-livestock environment interactions create conditions conducive to climate-driven disease persistence and expansion. Understanding these linkages is essential for developing climate-resilient control strategies.

Methods: Using a One Health framework, we integrated epidemiological data from human populations, prevalence data from domesticated ruminants, and community knowledge, attitudes, and practices (KAP) related to zoonotic trematode transmission. Surveys were conducted across Lake Victoria and Southern Highland zones, regions characterised by differing climatic and ecological conditions.

Results: High trematode infection levels in domesticated ruminants mirrored patterns of human exposure, indicating shared transmission pathways. Community awareness of schistosomiasis was relatively high; however, knowledge of fascioliasis, snail ecology, and climate-disease linkages was limited. Environmental changes, including altered rainfall patterns and water use behaviours, were perceived to influence disease occurrence, particularly in highland settings previously considered low risk.

Conclusion: Zoonotic trematode infections in Tanzania are shaped by complex interactions between climate, environment, animals, and human behaviour. Strengthening climate resilience in NTD control requires integrated One Health approaches that combine environmental management, animal health interventions, and inclusive human disease surveillance. Multisectoral collaboration is essential to mitigate future climate-driven expansion of these infections.

KEYWORDS: One Health; climate change; zoonotic diseases; snails; public health; trematodes; resilience; Tanzania

P0-OH-02

Mitigation Strategies for Occupational Exposures among Small-Scale Fishers in Northwest Tanzania

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Background: Small-scale inland fishers in tropical and subtropical countries face increasing exposure to climate-sensitive hazards, including extreme weather conditions, contaminated water, and ecological changes that raise the risk of injuries and disease. Changes in climate exacerbate these risks, impacting both health and livelihoods. This study applies Hierarchy of Controls (HoC) and Health Belief Model (HBM) to examine mitigation strategies and perceptions related to prevention of occupational exposures of climate-related hazards.

Methods: This qualitative study was conducted as part of a community-based survey in Northwest Tanzania to assess chronic kidney disease prevalence, occupational exposures, mitigation strategies, and barriers to prevention. Purposive sampling and consenting were applied, and in-depth interviews were conducted using a structured guide until saturation was reached. Deductive thematic analysis was applied, using HoC to classify mitigation strategies and HBM to explore perceptions related to climate hazards. Additional themes were identified inductively.

Results: Fishers reported various adaptive strategies aligned with HoC. Elimination and substitution measures included avoiding fishing during extreme weather, adjusting schedules, and using alternative water sources. Engineering controls were limited, with gaps in boat safety, emergency preparedness, and climate-adapted infrastructure. Administrative controls were weak, with limited training, lack of formal safety systems, and reliance on informal weather forecasts and traditional knowledge. Use of personal protective equipment (PPE) was common but often improvised and constrained by cost. Fishers perceived high risk and severity of climate-related hazards, including diseases, injuries, and economic losses. However, adoption of safety measures was limited by poverty, poor infrastructure, and restricted access to services.

Conclusion: Fishers practice some adaptive behaviors, but environmental adaptation is constrained by limited resources and systemic challenges. Improving access to affordable PPE, strengthening infrastructure, enhancing early warning systems, and providing continuous climate-informed training are essential. Integrated, community-based, and policy-supported approaches are needed to improve adaptation and reduce risks.

KEYWORDS: Occupational exposures; Small-scale fishers; Mitigation strategies; Environmental adaptation; Climate-related hazards; Hierarchy of Controls (HoC); Health Belief Model (HBM); Personal Protective Equipment (PPE)

P0-0H-01

Integrating Wastewater Surveillance and Genomics for *Salmonella enterica* and *Vibrio cholerae* in Tanzania: A One Health Approach

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Background: Waterborne pathogens are a major public health threat causing morbidity and mortality in Tanzania. *Salmonella enterica* and *Vibrio cholerae* persist in water systems and environmental reservoirs. Wastewater and environmental surveillance using whole genome sequencing (WGS) enables detection of antimicrobial resistance (AMR) and virulence genes, supporting a One Health approach.

Objectives: To assess the genomic profiles of *V. cholerae* and *S. enterica* isolates from wastewater and environmental surveillance (WES) and evaluate their utility as a complementary public health intelligence tool.

Methods: A total of 160 samples were collected from wastewater, clean, dirty, and groundwater in Tanga and Dar es Salaam (January–December 2025). Identification was confirmed using MALDI-TOF (VITEK MS). WGS was performed on the Illumina MiSeq platform, and bioinformatics tools were used to detect AMR and virulence genes.

Results: 16 isolates were recovered: 9 (5.6%) *S. enterica* and 5 (3.1%) *V. cholerae* from clean (n=5), sewage (n=7), dirty (n=1), and groundwater (n=1). *S. enterica* carried multiple AMR genes (*fosA7.2*, *aac(6')*-*laa*, *mdsA/mdsB*) and virulence genes (*invA*, *ipfB*, *sinH*, *avrA*, *sseK2*, *sspH2*, *sodC1*, *iroB*, *iroC*, *ybtP*, *ybtQ*), indicating high pathogenic potential. Sequence types included ST3269, ST4018, ST1419, ST7674, ST5557, with outbreak-associated ST421 and ST473. WGS quality was 86.7% at Q30 with 36.6× coverage. *V. cholerae* harbored AMR genes (*blaCARB-2/7*, *qnrVC7*, *tet(A/G)*, *floR2*), conferring multidrug resistance; WGS Q30 was 94.6% with 30.8× coverage. All were non-O1/non-O139 and lacked *ctxA* and *tcpA*, suggesting environmental strains. Discussion: Environmental waters harbor AMR. *S. enterica* displayed multidrug resistance and virulence, indicating invasive potential, while *V. cholerae*, particularly in sewage, carried AMR despite lacking virulence genes, highlighting wastewater as an AMR hotspot.

Conclusion: Detection of virulent, multidrug-resistant *S. enterica* and non-toxigenic, AMR-*V. cholerae* underscores environmental reservoirs' public health risk. Integrating environmental and genomic surveillance into a One Health strategy can complement clinical monitoring.

KEYWORDS: Environmental surveillance; Wastewater surveillance; Whole genome sequencing (WGS); Antimicrobial resistance (AMR).

Longitudinal surveillance of *Anopheles* mosquitoes across different settings in Tanga and Unguja: increased distribution of *An. merus* in coastal and inland areas of Tanzania

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Background: Understanding the distribution and composition of malaria vectors is critical for effective control in endemic regions. Shifts in *Anopheles* species can alter transmission dynamics and compromise intervention strategies. This study investigated the temporal and spatial distribution of *Anopheles* mosquitoes and their *Plasmodium* infections in Tanga region and Unguja, Zanzibar, Tanzania.

Methods: Between September 2021 and December 2023, monthly entomological surveys were conducted in 11 villages in Tanga and four Shehias in Unguja. Mosquitoes were collected indoors and outdoors using CDC light traps, Furvela tent traps, and prokopack aspirators. Species identification was performed by PCR, and *Plasmodium* infections were detected using TaqMan real-time PCR.

Results: A total of 4,771 *Anopheles* mosquitoes were collected (3,766 in Tanga and 905 in Unguja). PCR amplification failed in 100 samples. In Tanga, *An. gambiae* s.s. (43.8%) and *An. merus* (37.1%) predominated, while in Unguja, *An. arabiensis* (55.7%) and *An. merus* (41.9%) were most common. Seasonal variation was evident: *An. gambiae* s.s. and *An. funestus* s.s. peaked in the short rainy season, *An. arabiensis* peaked in both dry and long rainy seasons, and *An. merus* peaked across wet and dry seasons. *Plasmodium* infection rates were 3.0% in Tanga and 1.2% in Unguja, detected exclusively in *An. arabiensis*. Spatially, in Tanga, *An. gambiae* s.s., *An. merus*, and *An. funestus* s.s. were more abundant in upland and lowland areas, while urbanization limited *An. merus*. In Unguja, *An. arabiensis* and *An. merus* were less common in semi-urban areas but increased sharply during the wet season.

Conclusion: The findings reveal a shift in *An. gambiae* s.l. sibling species composition, with *An. merus* emerging as a significant vector across coastal and inland areas. Its observed infection with *Plasmodium falciparum* suggests a role in sustaining perennial transmission. These results highlight the need for year-round, multi-strategic vector surveillance and control approaches.

KEYWORDS: Malaria; *Anopheles* species; Vector distribution; *Plasmodium* species; Tanzania

Recurrent Drought and Mental Health among Pastoral communities in Northern Tanzania: A Mixed-Method study of Psychosocial Vulnerability and Coping systems

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Background: Climate change acts as a threat multiplier across human, animal, and environmental health systems. Recurrent drought disrupts pastoral livelihoods, depletes livestock assets, undermines food security, and forces population displacement, heightening psychological vulnerability. Yet the mental health burden of drought among pastoralist communities remains largely undocumented. Grounded in a One Health framework, this study examines depression, anxiety, and coping systems among Maasai pastoralists in Longido and Monduli districts, Arusha Region.

Methods: A mixed-methods design combines a cross-sectional survey with in-depth interviews (IDIs) and focus group discussions (FGDs) among adult pastoralists (≥ 18 years). Depression and anxiety are screened using the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7); food insecurity with the Household Food Insecurity Access Scale (HFIAS); and alcohol use with the Alcohol Use Disorders Identification Test (AUDIT). Quantitative data are analyzed in SPSS v27.0 using descriptive statistics, logistic regression, mediation, moderation, and confirmatory factor analysis (CFA). Qualitative data undergo reflexive thematic analysis.

Results: Pilot data ($n=9$, Longido District) show theoretically consistent patterns. Depression screen-positivity was 11.1% (PHQ-9 ≥ 10 ; mean=5.3, SD=5.9); no anxiety cases (GAD-7 ≥ 10) were detected, though mild symptoms were present in 44.4%. Drought exposure was substantial: 77.8% experienced three or more droughts, 66.7% reported livestock losses, and 55.6% were forced to migrate. A dose-response gradient was observed, with mean PHQ-9 scores rising across drought severity levels (Mild: 0.0; Moderate: 4.5; Severe: 9.8). Women reported higher depressive symptoms than men (mean PHQ-9: 6.6 vs. 3.8). Full data collection is ongoing, with complete analysis expected to confirm these patterns and examine mediating pathways.

Conclusion: This study will generate the first One Health-informed, mixed-methods evidence on drought-related mental health among Maasai pastoralists in Tanzania. Findings will inform multisectoral policies integrating mental health into climate-resilient health systems and advance universal health coverage in climate-vulnerable pastoral settings.

KEYWORDS: Depression; Anxiety; Pastoralist; Vulnerability and One health

Epidemiological, geospatial, and factors associated with influenza virus infections among patients at sentinel sites in Tanzania, 2023-2024

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Background: Influenza infection is a significant global public health concern caused by RNA viruses of the Orthomyxoviridae family, resulting in substantial morbidity and mortality each year. In Tanzania, influenza surveillance has been conducted since 2008 through the National Influenza Sentinel Surveillance System (NISS). This system monitors Influenza-like illness (ILI), Acute Respiratory Infections (ARI), and Severe Acute Respiratory Infections (SARI) across 30 sentinel sites.

Objective: This study aimed to determine the epidemiological patterns, prevalence, risk factors, and geographical distribution of influenza virus infections among patients enrolled in the influenza sentinel surveillance system in Tanzania from 2023 to 2024.

Methods: A secondary data analysis was conducted using surveillance data from 30 sentinel sites across Tanzania. A total of 18,325 patients meeting the case definitions were enrolled. Laboratory confirmation was performed using real-time reverse transcription polymerase chain reaction. Data were analyzed using descriptive statistics, chi-square tests, multivariable logistic regression, and spatial analysis.

Results: The overall prevalence of influenza infection was 7.70%, with 4.99% attributed to Influenza A and 2.71% to Influenza B. Higher infection rates were observed among individuals aged 6–18 years (10.53%). Significant symptoms were cough (aOR = 1.4, 95% CI: 1.15–1.74), runny nose (aOR = 1.45, 95% CI: 1.25–1.69, 95% CI: 1.38–1.84), headache (aOR = 1.60, 95% CI: 1.14–1.51), and body pains (aOR = 1.31, 95% CI: 1.14–1.51). Conversely, individuals aged ≥ 60 years (aOR = 0.64, 95% CI: 0.52–0.79), those with difficulty in breathing (aOR = 0.80, 95% CI: 0.70–0.92), and hospitalized (aOR = 0.71, 95% CI: 0.60–0.84) were less likely to test positive. Spatial analysis revealed a heterogeneous distribution of cases across regions.

Conclusion: Influenza remains actively circulating in Tanzania, with a notable burden among school-aged children and distinct epidemiological patterns. Strengthening surveillance systems and expanding diagnostic testing to include other respiratory pathogens are essential to understand circulating pathogens.

KEYWORDS: Influenza virus; epidemiology; sentinel site; Tanzania

Traditional, Complementary, and Integrative Medicine

19 Abstract(s)

OR-MCH-24

Traditional Healers as Partners in Improving Adolescent Sexual and Reproductive Health in Tanzania

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Background: Adolescents and young women (AGYW), often seek traditional healers for sexual and reproductive health and rights (SRHR) concerns due to accessibility, trust, and cultural acceptability. The Adolescent Girl's Health and Rights (AGHR) program in Katavi Region conducted a Gender Equality and Inclusion (GEI) assessment which revealed that AGYW often avoid health facilities because of stigma, distance, and provider bias, preferring pharmacies or traditional healers. Despite their influence, traditional healers have historically been under engaged in SRHR programming, highlighting opportunities for structured collaboration to strengthen referral and care.

Methods: In collaboration with the Ministry of Health and the Traditional and Alternative Medicine Traditional Council, the project co-created a training manual for traditional and alternative medicine practitioners. The manual addressed GEI, SRHR, gender-based violence (GBV), child protection, early marriage, and referral mechanisms. Using this curriculum, 115 traditional healers and 50 community leaders were trained, emphasizing gender-sensitive practices, discouraging harmful traditional practices, and use of official referral registers.

Results: Healers reported reduced provision of harmful practices (e.g., abortion medicine) and increased referrals of adolescents to health facilities. Participants noted perceived declines in early marriage, home delivery, and GBV, attributed to community awareness and advocacy. Over 900 AGYW were reached with SRHR messages. Improved health facility coordination via referral registers was also reported. Findings reflect practitioner perceptions, not measured outcomes.

Conclusion: Qualitative reflections with trained healers indicate perceived shifts in practices and community norms. Healers reported reduced provision of practices, such as abortion medicine, and increased referral of adolescents to health facilities. Participants described perceived reductions in early marriage, home delivery, and GBV, attributing this to increased community awareness and advocacy efforts and reported reaching over 900 AGYW with SRHR messages. Improved coordination with health facilities through referral registers was also reported. These findings reflect practitioner perceptions rather than measured outcomes.

KEYWORDS: Adolescent Sexual and Reproductive Health and Rights (SRHR); Engaging Traditional Healers; Gender Equality and Inclusion (GEI); Harmful Traditional Practices

OR-TCIM-01

The survey of medicinal plants in the Amani Botanical Garden, East Usambara, Tanzania.

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Background: The Amani Botanical Garden (ABG) was established in 1902, in the eastern Usambara mountains as part of the Amani Agricultural and Biological Research Institute. The ABG and some botanic garden infrastructures still exists, however, the composition of medicinal plants in the garden is not known. In order to document and preserve medicinal plants used by local healers, this study was designed to provide a baseline for future research.

Objective: This study was to establish types and distribution of medicinal plants in the ABG.

Methods: Botanical survey data were collected electronically by handset using digitalized system of data collection. Plantation areas in the botanical garden were surveyed and medicinal plants were recorded using GPS coordinates. Furthermore, samples of medicinal plants were collected for further identification and preservation in the herbarium.

Results: A total of 220 medicinal plants were recorded, which belong to 79 plant families. The majority of plant species were from the Fabaceae family (25), Asteraceae (15), Rubiaceae (12), and Lamiaceae (11). After comparing survey finding with documented records, we found that only 13 out of the 46 medicinal plants historically planted by the Germans (1902-1918) in the Amani Botanical Garden remain, while 33 species have disappeared.

Conclusion: This study reveals the presence of medicinal plants in the ABG which serves the community surrounding in treatment of several diseases. This finding highlights the urgent need for conservation and restoration measures to safeguard the medicinal plant heritage of the Amani ecosystem.

KEYWORDS: Medicinal plants; Amani botanic garden

OR-TCIM-02

Alpha-amylase and alpha-glucosidase inhibitory effects of *Hymenodictyon floribundum* stem bark: Supporting its ethnomedicinal role in diabetes management

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Background: *Hymenodictyon floribundum* is a medicinal plant widely distributed across tropical Africa, including Tanzania. Its bark, leaves, and roots are traditionally used to manage various health conditions, including diabetes, cough, vaginal candidiasis, diarrhea, tumors, and genital warts. Despite its widespread ethnopharmacological use, scientific evidence validating its antidiabetic potential is limited. **Aim:** This study aimed to evaluate the in vitro antidiabetic activity of *H. floribundum* stem bark extract and its isolated bioactive compound.

Methods: Stem bark was collected, dried, and extracted using 80% ethanol. The crude extract was fractionated into dichloromethane, ethyl acetate, and methanol fractions, which were screened for antidiabetic activity against α -amylase and α -glucosidase enzymes. The active fraction was further subjected to column chromatography to isolate bioactive compounds, which were characterized using GC-MS/MS and NMR. The isolated compound was retested for enzyme inhibitory activity.

Results: The methanolic fraction exhibited moderate inhibitory activity against α -amylase ($IC_{50} = 49.1 \mu g/mL$) and α -glucosidase ($IC_{50} = 40.9 \mu g/mL$), showing lower potency than the standard drug acarbose ($IC_{50} = 25.6$ and $29.9 \mu g/mL$, respectively). The fraction inhibited α -glucosidase more effectively than α -amylase, whereas acarbose inhibited α -amylase more strongly. The isolated compound, Scopoletin, displayed moderate inhibition of both enzymes, with greater activity against α -glucosidase ($IC_{50} = 37.7 \mu g/mL$) than against α -amylase ($IC_{50} = 59.2 \mu g/mL$), suggesting selective potential to control postprandial glucose levels. Overall, the methanolic fraction was more potent than Scopoletin alone, likely due to synergistic effects among multiple bioactive constituents present in methanolic fraction.

Conclusion: These findings demonstrate that *H. floribundum* possesses significant therapeutic potential as a source of antidiabetic agents and provide strong scientific validation for its traditional use in diabetes

management.

KEYWORDS: Diabetes; Enzymes; *Hymenodictyon floribundum*; Scopoletin; Traditional medicine

OR-TCIM-04

Comparative anti *Staphylococcus aureus* activity of *Moringa oleifera* leaf extracts: Crude aqueous and ethanolic preparations versus their principal chemical fractions

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Background: To combat antimicrobial resistance, this study investigates *Moringa oleifera*, a traditional medicinal plant. We addressed a key knowledge gap by comparing the anti-staphylococcal activity of crude leaf extracts to their chemical fractions.

Methods: Antimicrobial activity was assessed using agar well diffusion and the broth dilution method for Minimum Inhibitory Concentration (MIC). The crude aqueous and ethanolic extracts were fractionated using liquid-liquid partitioning. The aqueous extract was sequentially partitioned into ethyl acetate and n-butanol fractions, while the ethanolic extract was partitioned into petroleum ether, ethyl acetate, and aqueous fractions. These fractions, alongside the crude extracts, were tested against *S. aureus*.

Results: Both crude extracts showed activity only against *S. aureus*, with the ethanolic extract exhibiting a larger inhibition zone (6.5 mm) and a lower MIC (1.25 mg/ml) than the aqueous extract (5.8 mm; MIC 0.1 g/ml). Fractionation revealed that the ethyl acetate fraction of the ethanolic extract contained the highest concentration of flavonoids and phenolic compounds and demonstrated the strongest anti-staphylococcal activity (MIC of 0.3125 mg/ml), significantly surpassing the activity of the parent crude extract. The n-butanol fraction of the aqueous extract also showed enhanced activity compared to the crude aqueous extract. However, the activity of the most potent fraction was still lower than the standard gentamycin control.

Conclusion: This work validates *M. oleifera*'s anti-staphylococcal use. The superior activity of the ethyl acetate fraction identifies flavonoids/phenolics as key agents. The efficacy of crude extracts supports their continued traditional use, while identifying potent fractions guides future phytomedicine development. The study recommends isolation and characterization of active compounds from the ethyl acetate fraction; Conduct in vivo safety and efficacy studies; standardize extract preparation and dosage; investigate synergistic effects with antibiotics like gentamycin to enhance antimicrobial activity and address antimicrobial resistance.

KEYWORDS: *Moringa oleifera*; antimicrobial activity; *Staphylococcus aureus*; fractionation; flavonoids; phenolic compounds; crude extract.

OR-TCIM-06

Ethnobotanical Survey of Medicinal Plants and Practices of Traditional Healers in North Pemba Region of Zanzibar: Implications for Sustainable Use and Conservation

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Background/

Introduction: Ethnobotanical surveys are critical for documenting medicinal plant diversity, preserving indigenous knowledge, and supporting conservation efforts. In North Pemba, Zanzibar, information on medicinal plants and traditional healing practices remains limited despite their importance in primary healthcare. This study aimed to identify medicinal plants used by traditional healers, assess their therapeutic applications, and explore implications for sustainable use and conservation.

Methods: A cross-sectional ethnobotanical survey was conducted using semi-structured interviews, free listing, and guided field walks. A total of 182 traditional healers and herbal practitioners from 23 shehias (wards) in North Pemba participated. Data collected included plant species, preparation methods, sources, and perceived threats to availability. Descriptive analysis was used to summarize findings.

Results: The study documented 96 medicinal plant species across 47 families, with Euphorbiaceae, Lamiaceae, Rubiaceae, and Asteraceae being the most represented. Commonly cited species, including *Erythrina abyssinica* and *Guilandina bonduc*, were used to treat fever, digestive, reproductive, and respiratory conditions. Decoction and oral administration were the predominant preparation and usage methods. Most plants (65.9%) were harvested from the wild, often from ecologically sensitive areas such as Ngezi Forest Reserve, with leaves and roots being the most utilized parts. Overharvesting and climate variability (each reported by 38% of participants) were identified as major threats to plant availability. Additionally, 92.3% of practitioners operated without formal registration, although many supported regulatory integration. While trade was largely local, some high-demand species were distributed beyond the region.

Conclusion: Medicinal plant use in North Pemba reflects local disease patterns and highlights the clinical and cultural importance of traditional knowledge. However, unsustainable harvesting and environmental pressures threaten both biodiversity and knowledge systems. **Recommendations:** Promote cultivation of high-demand species, regulate wild harvesting, strengthen conservation of key habitats, and integrate traditional healers into the formal health system through registration, training, and policy support.

KEYWORDS: Medicinal plants; Traditional medicine; Traditional healers; Conservation; and Community

OR-TCIM-07

An exploration of the East Usambara traditional healing practices in the context of the Historical Amani Botanical Garden

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Background: The Amani region, home to the Smbaa people and a historic botanical garden, features a rich ethnomedical landscape where traditional healing incorporates native and colonial-introduced flora. The area, intertwined with a nature reserve, boasts high biodiversity, with many plant species, including endemic and medicinal ones. Traditional healers are vital to local healthcare for conditions such as malaria and reproductive health issues, but environmental changes and species loss threaten their expertise, necessitating urgent documentation and preservation. This study aimed to document traditional healing practices, the medicinal uses of native and colonial-era plants, and the spiritual and ethical frameworks that govern Smbaa ethnomedicine in the vicinity of the Amani Nature Reserve.

Methods: Ten in-depth interviews were conducted with traditional healers and herbalists across Amani Hill villages to explore the use of medicinal trees. Data was thematically analysed.

Results: TH knowledge is primarily passed down through family lineage, apprenticeship, or spiritual intervention, and requires specific personal conduct, such as sobriety or mental preparation. Illnesses were categorised as

either physical ailments or spiritual possessions. A critical finding is the concept of "natural strength" (nguvu ya asili), which dictates rigorous preparation protocols and spiritual activation to function to prevent the loss of a plant's potency. Healers identified a diverse pharmacopoeia for treating respiratory ailments, non-communicable diseases, maternal and child health, infectious diseases, and social and spiritual issues. In the overall, emphasis was on addressing reproductive issues, such as infertility, and chronic conditions that they perceived biomedicine struggles to solve. Furthermore, colonial-era introductions like cinchona and derris elliptica have been incorporated into local practice but are now rare.

Conclusion: The reported healing practices represent a sophisticated intersection of botanical expertise, historical memory, and spiritual faith. Protecting this indigenous wisdom and conserving the Amani ecosystem is essential for maintaining both cultural heritage and community health resilience.

KEYWORDS: Traditional healing; herbalism; East Usambara; Tanzania

OR-TCIM-08

Ethnobotanical survey of herbal steam inhalation (nyungu) in Zanzibar: Medicinal plant use, cultural value, and tourism potential

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Background: Traditional herbal steam inhalation (Nyungu) is a key healthcare practice in Zanzibar for treating respiratory, febrile, and spiritual ailments. Despite its importance, it remains underdocumented and underutilized in wellness tourism. This study aimed to document the medicinal plants used in Nyungu and explore opportunities for integration into tourism.

Materials and Methods: A cross-sectional ethnobotanical survey was conducted in 26 shehias (14 in Unguja and 12 in Pemba). Sixty-eight traditional healers were purposively selected and interviewed using structured questionnaires. Data on plant use, preparation, treated ailments, and commercialization were analyzed using SPSS and Origin software.

Results: The study identified 73 and 75 plant species in Unguja and Pemba, respectively. Commonly cited species included *Citrus aurantiacus*, *Azadirachta indica*, and *Ocimum americanum*. The main ailments treated were runny nose (18%), fever (15%), common cold (13%), and spiritual disorders (12%). Treatment regimens varied: most healers in Unguja preferred one-day sessions, while those in Pemba favored three- to seven-day durations. Polyherbal preparations were widely used. Commercialization was limited, with 60% of healers in Unguja and 84% in Pemba not offering services to tourists. Documentation was low, as only 8% (Unguja) and 17% (Pemba) recorded their practices.

Conclusion: Nyungu remains a cornerstone of traditional healthcare in Zanzibar and holds promise for wellness tourism. However, poor documentation, limited commercialization, and lack of standardization hinder its development. Phytochemical validation, cultivation of key species, tourism integration, and supportive policies are recommended for sustainable use and cultural preservation. Keywords: Ethnobotany, Medicinal Plants, Wellness Tourism, Nyungu (Steam Inhalation), and Cultural Preservation

OR-TCIM-09

German Colonial Botany and the Enduring Remains of Medicinal Plants in Amani, Tanzania: Historical Insights and Contemporary Relevance

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AFFILIATIONS

Background: Medicinal plants have long played an integral role in healthcare around the world, particularly in Tanzania, where traditional medicine is still widely practised. The Imperial Biological-Agricultural Institute Amani, established by the German Colonial Office in June 1902 and now known as the Amani Hill Research Station under Tanzania's National Institute for Medical Research, served as a centre for tropical botanical, agricultural and medical research. The institute focused on plants with economic and therapeutic potential that aligned with German colonial interests. Understanding the remains of these colonial-era plant introductions is valuable for current ethnobotanical and conservation efforts. This study examined the introduction and cultivation of medicinal plants at the Amani Botanical Garden during the period of German colonial rule (1902–1914), and evaluated their continued importance in modern-day Tanzanian ethnomedicine.

Methods: Archival documents from the Amani Institute, German and British colonial scientific archives, were analysed alongside ethnobotanical literature. The plant species were standardised and cross-referenced with modern botanical databases. Qualitative and quantitative analyses were conducted to examine species origin, distribution and medicinal applications.

Results: More than 50 medicinal plant species were introduced and cultivated at Amani, with *Cinchona* species used for malaria treatment via quinine, comprising nearly half. The plants originated from Africa (33%), South America (34%), Asia (20%), North America (10%), and Oceania (3%), reflecting a broad transcontinental bioprospecting network. Several introduced species, such as *Aloe ferox*, *Antiaris toxicaria*, and *Jatropha curcas*, continue to play important roles in local healthcare and environmental management, demonstrating successful integration into indigenous knowledge systems.

Conclusion: The Amani Botanical Garden's collections embody a lasting colonial scientific and medical heritage that remains relevant in Tanzanian ethnobotany today. This legacy highlights the need for ethical stewardship of botanical resources and the integration of historical, ethnobotanical, and ecological approaches to support sustainable conservation and health practices.

KEYWORDS: Medicinal plants; Ethnobotany; Amani Botanical Garden; German colonial Tanzania; Traditional medicine; Biodiversity conservation

OR-TCIM-10

Ethnopharmacological considerations of plants traditionally used by local communities to manage maternal conditions in Tanzania: a scoping review

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AFFILIATIONS

1. National Institute for Medical Research

Introduction: Despite notable progress in maternal health and a reduction in maternal mortality rates, Tanzania still falls short of global targets. Local women increasingly use herbal medicine to manage maternal conditions, highlighting the need to document and evaluate these traditional practices.

Objective: To identify the medicinal plants commonly used by women to manage maternal conditions and to critically evaluate the available scientific evidence regarding their efficacy and safety.

Methods: A scoping review was conducted in accordance with the framework of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR). Articles were retrieved from PubMed, Web of Science, Scopus, African Index Medicus (AIM), Maternity and Infant Care (MIC), and CINAHL, covering the period from inception to July 2025. Eligible studies were screened for relevance and taxonomic accuracy. Data were analyzed using descriptive statistics (frequency distribution and percentages) in Microsoft Excel.

Results: A total of 330 plant species from 82 families were identified across 14 regions. Morogoro, Pwani, and Kagera exhibited the highest species diversity. The most represented families were as follows: Fabaceae (57 species), Rubiaceae (22 species), and Asteraceae (18 species). Frequently cited plants included *Azadirachta indica* A. Juss. (five citations), *Annona senegalensis* Pers., (four citations), and *Ricinus communis* L. (four citations). Twelve maternal conditions were reported to be managed using at least one of these plant species. However, only 23 species (7%) had scientific evidence supporting their traditional use, and only 74 species (22%) had safety data confirming non-toxicity.

Conclusion: Tanzanian women utilize a wide range of medicinal plants to manage maternal conditions; however, only a small proportion of these plants have been scientifically validated or have safety data. Further pharmacological and toxicological studies are needed to verify their efficacy and ensure maternal safety.

OR-TCIM-13

Is traditional medicine controversial in Africa? A critical review

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2. Muhimbili University of Health and Allied Sciences

Background: Traditional medicine (TM) remains an essential component of healthcare in Sub-Saharan Africa, where up to 80% of the population relies on it for primary care. Deeply rooted in cultural beliefs and local health practices, TM continues to play a significant role in disease prevention and treatment. Several African countries are working to integrate TM into national health systems, recognizing its accessibility, affordability, and alignment with community values.

Methods: This is a critical literature review paper that incorporates data and information from a variety of sources, including academic journals and articles, books, government and non-governmental organization reports, and theses searched from Google Scholar, PubMed, and African Journals Online (AJOL). The data from the relevant documents were thematically analysed and presented in themes, tables, and figures.

Results: Findings reflect an imbalanced debate. Supporters emphasize TM's contribution to universal health coverage, its holistic approach, use of indigenous resources, and reported effectiveness in areas such as maternal and mental health. High utilization, especially in rural and underserved populations, underscores its continued relevance. However, critics point out the limited scientific validation, safety concerns, regulatory weaknesses, and difficulties in standardization and formal integration on the use and development of TM. Additional issues include inadequate practitioner training, environmental pressures on medicinal plants, and risks linked to commercialization.

Conclusion: The debate over TM in Africa reflects the tension between its cultural importance, widespread use, and the concerns about safety, evidence, and regulation. TM remains vital for underserved populations and contributes meaningfully to primary healthcare, yet ongoing weaknesses in quality control, practitioner training, and scientific validation limit its full potential. Strengthening regulatory frameworks, promoting collaborative research, and fostering respectful integration with conventional care are essential steps forward.

KEYWORDS: Culture; Integration; Regulation; Safety; Traditional medicine

OR-TCIM-14

Heavy Metal and Toxic Element Analysis in Traditional Medicines: Implications for Patient Safety in Integrative Care

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AFFILIATIONS

Background: The global rise of integrative healthcare has increased patient exposure to traditional medicines alongside conventional treatments. However, many traditional remedies lack rigorous safety profiling, particularly regarding contamination with heavy metals and toxic elements.

Objective: This study aims to conduct a comprehensive elemental analysis of commonly used traditional medicines to quantify levels of toxic metals and assess the potential health risks to patients in integrative care settings.

Methods: A total of 150 traditional medicine samples (herbal formulations, powders, and tinctures) were collected from registered traditional health practitioners across three regions. Inductively Coupled Plasma Mass Spectrometry (ICP-MS) was employed to quantify concentrations of lead, mercury, arsenic, cadmium, and chromium. Results were compared against WHO permissible limits and pharmacopoeial standards. Hazard Quotients and Cancer Risk factors were calculated to estimate long-term health implications.

Results: Preliminary findings indicate that 34% of samples exceeded WHO limits for at least one heavy metal, with lead and arsenic being the most prevalent contaminants. Metal concentrations varied significantly based on geographical sourcing, preparation methods, and storage conditions. Hazard Quotient calculations revealed potential non-carcinogenic risks in 22% of samples with chronic use scenarios.

Conclusion: The presence of elevated toxic elements in traditional medicines poses significant patient safety concerns, particularly when combined with conventional treatments that may share similar toxicity profiles. This study underscores the urgent need for mandatory quality control protocols, regulatory harmonization, and practitioner education to safeguard patients in integrative healthcare systems. Collaborative frameworks between traditional healers and formal health systems must include toxicological screening as a non-negotiable component of patient safety.

OR-TCIM-15

Use and Perceived Effectiveness of Traditional Medicines in Managing COVID-19

Symptoms: An Exploratory Qualitative Study in Dar es Salaam, Tanzania

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AFFILIATIONS

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Introduction: The use of traditional medicine to address Covid-19 related symptoms in Tanzania was widespread especially based on government promotion in 2019. We present perceived effectiveness in the use of traditional medicines in the treatment and prevention of Covid-19 in the main city of Dar es Salaam.

Objectives: To identify traditional medicines used to treat Covid-19 related symptoms and explore the perceptions, beliefs, and perceived effectiveness of public on use of these products.

Methods: This study used qualitative data collection methods in Dar es Salaam, being the largest city with the highest rate of infections during the first Covid-19 wave. Study population included purposefully sampled population including pharmacists, local vendors, scientific experts, health policy and most importantly, the public. We conducted key informant interviews and in depth interviews to gather this information. Analysis: Coding was done and content thematic analysis was undertaken as per study objectives.

Results: Nineteen herbs were identified as ingredients commonly used in addressing Covid 19. In addition, forty eight participants highlighted significant use of traditional medicines in 2019. The main reasons for increased use were government under late President Magufuli instrumentality in promoting traditional medicines use during this

era, lack of effective bio-medical solutions, and ability of traditional medicines to reduce fear and worry among the general public. Most participants acknowledged that the previous negative beliefs that persisted towards traditional medicines have changed.

Conclusion: This study identified and documented common herbs and products used during this era. The public testimonies show the perceived effectiveness of use of traditional medicines in treating Covid-19 infection. Our findings suggest in situations of lack of biomedical treatment, use of traditional medicines is important in ameliorating symptoms in prevention and treatment as revealed in this study as many people were helped during Covid 19 outbreak in Tanzania.

KEYWORDS: Traditional medicines use; Covid 19; amelioration of symptoms; Dar es Salaam Tanzania

OR-TCIM-16

Effectiveness on the Use of Traditional Medicines in Ameliorating and Treating Covid-19 pandemic: Experience from Dar es Salaam City Tanzania a Exploratory Qualitative Research

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Introduction: The use of traditional medicine to address Covid-19 related symptoms in Tanzania was widespread especially based on government promotion since 2019. In this paper we present Tanzanian experience in the use of traditional medicines in the treatment and prevention of Covid-19 in the main city of Dar es Salaam.

Objectives: To identify traditional medicines used to treat Covid-19 related symptoms and explore the perceptions, beliefs, and perceived effectiveness of public on use the of these products.

Methods: This study used qualitative data collection methods in Dar es Salaam, being the largest city with the highest rate of infections during the first Covid-19 wave. Study population included pharmacists, local vendors, scientific experts, health policy and most importantly, the public. We conducted key informant interviews, in depth interviews, and focus group discussions to gather this information.

Results: Nineteen herbs were identified as ingredients commonly used in addressing Covid 19. In addition, forty-eight participants were involved in this study, and they highlighted significant growth in the use of traditional methods when the Covid-19 outbreak began in 2019. The main reasons for increased use were government under late President Magufuli instrumentality in promoting traditional medicines use during this era, lack of effective bio-medical solutions, and ability of traditional medicines to reduce fear and worry among the general public. Most participants acknowledged that the previous negative beliefs that persisted towards traditional medicines have changed.

Conclusion: This paper is a documentation of most common herbs and products used during this era. The public testimonies show the effectiveness of use of traditional medicines in treating Covid-19 infection. In situations of lack of biomedical treatment, use of traditional medicines is important in ameliorating symptoms in prevention and treatment as revealed in this study as many people were helped during Covid 19 outbreak in Tanzania.

OR-TCIM-17

A machine learning-based platform to predict immunomodulatory profiles of natural and traditional medicine extracts using dendritic cell transcriptomes

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Background: Traditional medicine and botanical extracts are increasingly used worldwide for health promotion and immune support, yet their complex immunomodulatory mechanisms remain poorly characterized. Conventional assays based on a few surface markers cannot capture the multidimensional immune pathways engaged by diverse natural products, limiting objective comparison across preparations and regions. There is therefore a need for robust, high-throughput platforms that systematically profile immune signatures of natural and traditional medicine-derived extracts to support evidence-based development and global standardization.

Objective: This study aimed to develop DCIMDEX (Dendritic Cell Immune-Modulatory Index), a machine learning-based platform that uses dendritic cell transcriptomes stimulated with reference immuno-functional materials to predict high-resolution immunomodulatory profiles of natural and traditional medicine-derived extracts.

Methodology: Bone marrow-derived dendritic cells were treated with 17 standard immuno-modulatory materials and controls. Immune-modulatory properties were quantified by flow cytometry, and four indices were calculated from the expression of MHC II, CD11c, CD11b, CD40, and PD-L1. Bulk RNA sequencing of the same cells was performed and normalized, and a Random Forest-based multi-class classifier was trained on these transcriptomic profiles to assign immune-activating, immune-tolerizing, or neutral labels.

Results: DCIMDEX achieved a weighted average predictive accuracy of 83% and a macro-averaged F1-score of 0.79. The model showed an ROC-AUC of 0.99 for identifying immune-activating materials and maintained robust performance on independent test sets, including samples with different ingredient specifications and sub-fractions such as saponin versus non-saponin fractions. These findings indicate that DC transcriptome-based machine learning can sensitively discriminate distinct immunomodulatory signatures of complex natural mixtures relevant to traditional medicine.

Conclusion: By integrating supervised machine learning with dendritic cell transcriptomics, DCIMDEX provides an objective, high-throughput tool to evaluate the efficacy and mechanisms of immune-modulatory candidates from natural products and traditional medicine, supporting evidence-based development, quality control, and global standardization of traditional medicine-derived immune health products.

KEYWORDS: Immune modulation; Dendritic cells; Traditional medicine; Natural extracts; Machine learning.

P0-TCIM-05

Ethnobotanical survey of antidiabetic plants used by Maasai traditional practitioners in Monduli District, Arusha, Tanzania

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Introduction: The prevalence of diabetes is rising rapidly in developing countries including Tanzania, where access to conventional drugs is constrained by limited resources. Consequently, traditional medicine, particularly medicinal plants, remains a key source of antidiabetic therapy for many rural populations. However, documentation of plants used by rural healers especially Maasai traditional practitioners (MTPs) in Tanzania is scarce. This study aims to document the traditional knowledge and antidiabetic plants used by MTPs in Monduli District, Arusha, Tanzania.

Methods: An ethnobotanical survey was conducted from January to July 2024 among 55 MTPs in Monduli District, Arusha, Tanzania. Ethnobotanical data were collected through semi-structured interviews with MTPs, followed by plant identification and literature review to assess the novelty and reported uses of the documented species.

Results: The majority (70.9%) of MTPs had over 20 years of traditional experience of practice. The MTPs diagnose diabetes through signs and symptoms, and they identified physical inactivity (36%), high blood pressure (19%), and unhealthy diet (16%) as key risk factors for the development of diabetes. More than half (58.2%) of MTPs treat 1-10 diabetic patients per month. The study identified 41 species belonging to 21 plant families. The family Fabaceae represented the highest number of species (17%), followed by Combretaceae, Lamiaceae, and Solanaceae (7%). The most frequently cited antidiabetic plants were *Rhamnus staddo*, *Zanthoxylum chalybeum*, *Physalis peruviana*, *Albizia anthelmintica*, and *Pappea capensis*. Roots (41%) and barks (31%) were the most harvested plant parts. Decoction was the primary method of remedies preparation with oral administration being preferred route.

Conclusion: This study highlights the extensive antidiabetic knowledge of MTPs in the treatment of diabetes using medicinal plants. Of the 41 identified plants, over 81.5% have demonstrated promising antidiabetic activity in preclinical studies; however, further research is needed to isolate their bioactive compounds and elucidate their mechanisms of action.

KEYWORDS: Diabetes; Maasai traditional practitioners; Ethnobotany; Monduli

PO-TCIM-04

In vitro activity of *Solanum carolinense* extract against fungal isolates: A case study in Mbeya

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AFFILIATIONS

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Background: Fungal infections are very common in the world. About 300 million people suffer from serious fungal infection every year, accounting for 1.35 million deaths in immunosuppressed patients. Over 3% of Tanzanians suffer from serious fungal infections annually. *Absidia corymbifera* is one of the fungi found which cause zygomycosis in the form of mycotic and mucormycosis in human.

Methodology: This was a case study involving three samples collected from patients with suspect of fungal infections from lesions of head, leg and swab of surgical wound. The lesion samples were transported at room temperature. A pus from surgical wound discharge was suspended in 0.85% saline, maintained at 2-80C. Samples were cultured using Sabouraud Dextrose Agar at 370C and confirmed by celotape technique. We adjusted the isolates to McFarland 1.0 with 0.85% saline and tested with different concentration of *Solanum carolinense* fruit extract of serial dilutions 100 to 10-2). Fluconazole was used as a positive control. Data were analyzed using Microsoft Excel and recorded in figures.

Results: The fungal isolates presented both macroscopic and microscopic similar features as *Absidia corymbifera*. characteristics were, rapidly growth, white to greyish with, woolly texture cotton at 37oC, microscopic morphological characteristics were aseptate hyphae, resembles *Rhizopus*, sporangiophores arise on the stolon lie between the rhizoids, spherical sporangia to pyriform in shape. Testing the isolate against the extract we found the highest antifungal activity with zones of inhibition of 30mm, 28.5mm and 13.5mm for 100, 10-1 and 10-2 dilutions respectively. The zone of inhibition for the fluonazole control was 23.75mm.

Conclusion: We conclude that *Solanum carolinense* fruit extract showed promising antifungal activity against fungal isolates. These findings support the traditional use of this plant for treating fungal infection in the communities, However, further investigations are needed on isolating chemical activity in these plants.

KEYWORDS: Solanum; Fungal

Antibacterial Activity, Phytochemical Constituents, and Safety of Aqueous Bark Extract of *Terminalia brownii* Fresen.: Validation of Traditional Antimicrobial Use

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AFFILIATIONS

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Background: *Terminalia brownii* Fresen. is widely used in East African traditional medicine for treating infectious diseases, particularly diarrhea and dysentery. Despite its widespread ethnopharmacological use, scientific evidence supporting its antimicrobial efficacy and safety remains limited. This study aimed to evaluate the antibacterial activity, phytochemical constituents, potential mechanisms of action, and in vivo safety of the aqueous bark extract of *T. brownii*, with a focus on validating its traditional use against Gram-negative pathogens.

Methods: Antibacterial activity was assessed against eight Gram-negative bacterial strains using disk diffusion and broth microdilution methods. Liquid chromatography-mass spectrometry (LC-MS) was employed to identify phytochemical constituents. In silico molecular docking and molecular dynamics simulations examined compound interactions with *Escherichia coli* dihydrofolate reductase (DHFR), alongside absorption, distribution, metabolism, excretion, and toxicity (ADMET) prediction using SwissADME. Sub-acute toxicity was evaluated in male Swiss albino mice over 28 days following Organisation for Economic Co-operation and Development (OECD) guideline 407, with analysis of body and organ weights, haematological, and biochemical parameters.

Results: The extract exhibited strong antibacterial effects, notably against *Shigella flexneri* and *S. sonnei*. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) values ranged from 3.125 to 100 mg/ml; *Klebsiella pneumoniae* showed limited susceptibility. LC-MS identified catechin, lupeol, and naringenin as major bioactive compounds, all demonstrating high DHFR binding affinities, stable molecular dynamics profiles, and favorable ADMET characteristics. In vivo studies revealed no significant toxicity at doses ≤ 630 mg/kg, though mild hepatic and renal effects were observed at 1,000 mg/kg. **Conclusions and Recommendations** These findings validate the traditional use of *T. brownii* as an antimicrobial agent and highlight its potential as a source of DHFR-inhibiting compounds. Integration of these bioactive constituents into modern antimicrobial strategies is recommended, alongside further studies to isolate and characterize individual compounds and assess their clinical applicability.

KEYWORDS: *Terminalia brownii*; antibacterial activity; phytochemical constituents; dihydrofolate reductase; toxicity assessment

Medicinal plants for the treatment of diarrhoeal diseases among under-five children: Experiences from traditional healers in north-eastern Tanzania

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Background: Medicinal plants have long been used in the management of various diseases, including diarrhoeal illnesses among children. In many low-resource settings, traditional healers play a critical role in providing healthcare using herbal remedies. This study aimed to explore medicinal plants used by traditional healers in the treatment of diarrhoeal diseases among under-five children in north-eastern Tanzania.

Methods: A qualitative study employing a narrative design was conducted in Korogwe and Handeni districts. A total of 52 traditional healers were purposively selected and participated in in-depth interviews. Data were audio-recorded, transcribed verbatim and analyzed using thematic analysis.

Results: Traditional healer's demonstrated substantial knowledge of medicinal plants used to treat diarrhoeal diseases among under-five children. A total of 54 plant species were identified, with 15 being frequently reported by most participants. Commonly cited plants included *Psidium guajava*, *Rhus natalensis*, *Ozoroa insignis*, *Tamarindus indica*, *Ocimum suave*, *Combretum molle*, *Zanha africana*, *Solanum incanum*, and *Ximenia americana*. Additional plants frequently mentioned included *Ochna holstii*, *Elaeodendron schlechterianum*, *Albizia anthelmintica*, *Commiphora pteleifolia*, *Salacia stuhlmanniana*, and *Zenkerella grotei*.

Conclusion: Traditional healers possess extensive knowledge of herbal treatments for diarrhoeal diseases in under-five children and frequently utilize these remedies in practice. Further pharmacological and clinical studies are recommended to validate the efficacy and safety of these medicinal plants and explore their potential integration into formal healthcare systems.

KEYWORDS: Medicinal plants; Traditional medicine; Diarrhoeal diseases; Under-five children; Tanzania; Herbal remedies

PO-TCIM-01

Acute Toxicity, Immunomodulation Activities, and Phytochemical Profiles of *Sapium ellipticum* Stem Bark Aqueous Extract

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AFFILIATIONS

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Background: *Sapium ellipticum* stem bark is widely used in traditional medicine for the treatment of various ailments. However, limited scientific information exists regarding the safety and immunomodulatory potential of its extracts. This study aimed to evaluate the phytochemical profile, acute toxicity, and immunomodulatory activity of the aqueous stem bark extract of *S. ellipticum*.

Methods: Acute toxicity was evaluated according to the guidelines of the Organisation for Economic Co-operation and Development at doses of 123, 300, and 2000 mg/kg. Immunomodulatory activity was assessed using Real-Time Quantitative Polymerase Chain Reaction to determine the expression levels of cytokine genes IL-10, IL-6, IL-1Ra, and IL-1 β . Phytochemical profiling of the extract was performed using Liquid Chromatography-Tandem Mass Spectrometry.

Results: The aqueous extract of *S. ellipticum* stem bark showed no mortality or hematological and biochemical signs of toxicity, indicating that the lethal dose is greater than 2000 mg/kg. The extract demonstrated immunomodulatory activity, characterized by downregulation of IL-6 and IL-10 and upregulation of IL-1Ra and IL-1 β . Phytochemical analysis revealed the presence of bioactive compounds with potential anti-inflammatory properties, including Fraxetin and L-carnitine. Despite this, the extract also increased the expression of the pro-inflammatory cytokine IL-1 β , although no specific pro-inflammatory phytochemicals were identified.

Conclusion: The findings suggest that the aqueous stem bark extract of *S. ellipticum* is relatively safe at doses up to 2000 mg/kg and exhibits potential immunomodulatory activity. These results provide a foundation for further studies to isolate and characterize the active compounds and to explore their potential therapeutic applications.

KEYWORDS: *Sapium ellipticum*; toxicity; stem bark; immunomodulation; cytokines

Symposia

Addressing Post-Tuberculosis Lung Disease (PTLD): From Evidence to Policy and Practice in Tanzania

BACKGROUND

The proposed symposium aims to provide a comprehensive platform to explore Post-Tuberculosis Lung Disease (PTLD) from global, national, and policy perspectives. Despite increasing recognition of PTLD as a significant contributor to long-term morbidity among TB survivors, gaps remain in diagnosis, management, and integration into routine TB care particularly in high-burden settings such as Tanzania

PRESENTATIONS

1. S-03-01 Global Perspective on PTLD

Dr. Florence Jared Mtei — KIDH

2. S-03-02 Research Conducted in Tanzania on PTLD: Findings from the Impala Study

Dr. Elizabeth Shayo — National Institute for Medical Research

3. S-03-03 Research Conducted in Tanzania on PTLD: Findings from the NAC study

Dr. Julieth Lalashowi — National Institute for Medical Research

4. S-03-04 Research Conducted in Tanzania on PTLD: Boresha Afya ya Mapafu Project implementation and Evaluation of Integrated Lung Health clinics effectiveness in primary health facilities in Dar es salaam and Simiyu

Dr. Wanze Kohi — CIHEB

5. S-03-05 Management strategies: Integrating Pulmonary Rehabilitation to Address PTLD in TB Care

Prof. Stella Mpagama

6. S-03-06 Country-Level Initiatives and Progress by the National TB and Leprosy Programme (NTLP)

Dr. Riziki Kisonga

7. S-03-07 Policy Recommendations and Future Directions

Dr. Nyanda Elias Ntinginya — National Institute for Medical Research

Advancing Gene Drive Research for Malaria Control and Elimination in Tanzania: Scientific Progress, Field Characterization, and Stakeholder Engagement

BACKGROUND

Transmission Zero is an international research programme that strives to develop and test mosquito population modification gene drives for malaria control and elimination. Since 2015, progress in tackling malaria has been stalling. In sub Saharan Africa, populations at risk of malaria have increased, coverage of vector control interventions have flattened, and available tools are compromised by the rise of resistance. New efficient and

equitable tools to reduce and eliminate malaria are needed. Transmission Zero has been developing genetic vector control tools that aim to reduce malaria transmission by mosquitoes. These tools are developed and tested by the Ifakara Health Institute and The National Institute for Medical Research in Tanzania, in close collaboration with the Imperial College London and Swiss Tropical and Public Health Institute.

This symposium, “Advancing Gene Drive Research for Malaria Control in Tanzania: Science, Field Characterization, and Stakeholder Engagement,” aims to provide a comprehensive overview of the project’s efforts to responsibly develop and implement gene drive technologies.

The first presentation will provide the scientific foundation for understanding the potential of gene drive for malaria control and elimination in Africa. The second presentation will focus on field characterization in Ukerewe Island, which includes entomological studies and site readiness for potential future releases. The final presentation will explore stakeholder engagement initiatives carried by Transmission zero to ensure awareness raising among the stakeholders, communities and the public. In addition, the symposium will also hold a panel discussion titled “Potential of gene drive modified mosquitoes in malaria control and elimination in Africa”, which will provide an opportunity to discuss the opportunity and challenges of the innovative malaria control tools in Africa.

By linking scientific development, field activities, and stakeholder engagement, this symposium aims to provide a holistic perspective on gene drive implementation for malaria control and elimination in Tanzania.

PRESENTATIONS

1. **S-01-01 Biological Determinants of Malaria Transmission and Gene Drive Potential in African Anopheles Mosquitoes.**

Prisca Kweyamba — Ifakara Health Institute

2. **S-01-02 Baseline entomological data collection in Ukerewe: Field site analysis and trial preparation.**

Edmond Bernard — National Institute for Medical Research

3. **S-01-03 Transmission Zero’s Stakeholder Engagement Overview**

Justina Mosha — National Institute for Medical Research

Advancing research independence in Africa: Grant writing, mentorship and leadership pathways for Early- and Mid-Career Scientists

BACKGROUND

The transition from an early- or mid-career researcher (EMCR) to a fully funded Principal Investigator (PI) is often challenging for many young scientists. Without adequate mentorship and guidance, researchers may encounter significant hurdles and spend years trying to navigate the pathway toward research independence. This session aims to create a safe and open space where senior researchers and EMCRs can engage in honest, meaningful discussions about the realities of navigating this path — including what steps to take, when to take them, and how to strategically grow into successful independent researchers.

PRESENTATIONS

1. **TR-01 Addressing the research independence gap among African researchers**

Dr. Nyanda Ntinginya — National Institute for Medical Research, Mwanza - Tanzania

2. **TR-02 Building Research Independence in Tanzania: What Works and What Is Available**

Prof. Stella Mpagama — KIDH

Health, Economic and Social Returns of Investing in the Prevention of Gender-based Violence for Advancing Tanzania's Development Vision 2050

BACKGROUND

Violence against children (VAC) and gender-based violence (GBV) remain significant challenges in Tanzania, with far-reaching consequences for health, social systems, and economic development. Exposure to violence increases the risk of injury, mental health disorders, and long-term health complications, placing a sustained burden on health services while undermining productivity and human capital development. Addressing these challenges is therefore critical to advancing Universal Health Coverage (UHC) and achieving Tanzania's Development Vision 2050.

Parenting interventions have emerged as effective and cost-efficient strategies for preventing violence and promoting safe, nurturing family environments. By strengthening caregiver skills and improving parent-child relationships, these interventions reduce the risk of violence while supporting healthy child development. As preventive approaches, they help decrease long-term demand on health and social services, contributing to more resilient and sustainable systems.

This symposium aims to present evidence on the economic and social costs of VAC and GBV, demonstrate the effectiveness of parenting interventions, and explore opportunities for integrating these approaches into health and multisectoral systems. It will also foster policy dialogue on scaling prevention strategies within national frameworks.

The session will feature a mix of evidence presentations, case studies of parenting programmes, and perspectives from government and development partners. A panel discussion will examine practical challenges and opportunities for implementation, followed by interactive audience engagement to encourage knowledge exchange.

Expected outcomes include increased awareness among policymakers of the economic case for violence prevention, strengthened commitment to integrating parenting interventions into national strategies, and identification of opportunities for collaboration and sustainable financing. The symposium seeks to contribute to building resilient health systems and advancing Tanzania's long-term development goals.

The target audience includes policymakers, government officials across sectors, development partners, researchers, and civil society organisations engaged in health, social protection, and child development.

PRESENTATIONS

- 1. S-04-01 Building a National Support System to scale-up evidence-based Parenting programmes to prevent violence against children: Lessons from Tanzania**

Joyce Wamoyi — National Institute for Medical Research, Mwanza - Tanzania

- 2. S-04-02 What is in it for me? A Qualitative Study of Motivations and Barriers of Engagement with a Digital Parenting Intervention among Male caregivers' in Tanzania**

Kija Nyalali — National Institute for Medical Research, Mwanza - Tanzania

- 3. S-04-03 Pathways to Impact: Exploring mechanisms through which a blended-digital parenting intervention works to prevent Violence against adolescent in Tanzania**

Joyce Wamoyi — National Institute for Medical Research, Mwanza - Tanzania

4. S-04-04 Mental health, social and academic outcomes of technology-facilitated gender-based violence among female students in higher education: A qualitative study in Mwanza, Tanzania

Diana Aloyce Ishengoma — National Institute for Medical Research, Mwanza - Tanzania

5. S-04-05 Key Lessons from a Policy Framework Analysis for Scaling Parenting Interventions to Address Violence against Children in Tanzania

Gerry Mshana — National Institute for Medical Research, Mwanza - Tanzania

6. S-04-06 Detrimental effects of the different forms of technology facilitated violence on the mental health and general wellbeing of young male college students in Mwanza, Tanzania

Gerry Mshana — National Institute for Medical Research, Mwanza - Tanzania

7. S-04-07 Cost-effectiveness, Implementation, and Scaling Potential of ParentApp: A Digital Parenting Intervention to Improve Mental Health and Prevent Violence in Low-Resource Settings

Kija Nyalali — National Institute for Medical Research, Mwanza - Tanzania

8. S-04-08 Building a National Support System to scale-up evidence-based Parenting programmes to prevent violence against children: Lessons from Tanzania

Sebastian Kitiku — Ministry of Community Development, Gender, Women and Special Groups

New recommendation: From Malaria to Multisector Health: A Decade of School-Based Surveillance Informing Targeting and Integrated Interventions in Tanzania

BACKGROUND

This symposium presents a cohesive body of evidence on malaria among school-aged children in Tanzania, emphasizing their important role as a persistent and often asymptomatic reservoir of infection. The abstracts highlight how school-based surveillance, combined with advanced spatio-temporal and Bayesian modelling, provides high-resolution insights for sub-national stratification and targeted interventions. Findings also reveal key behavioral, socioeconomic, and environmental determinants of malaria risk, alongside critical health system challenges such as gaps in treatment-seeking, bed net utilization, and routine data quality. Additionally, the link between malaria and broader outcomes like anemia, stunting, and educational performance underscores its wider impact. Overall, the symposium advocates for integrated, data-driven approaches that connect surveillance, modelling, and routine health systems to inform policy and implementation, ultimately strengthening targeted malaria control efforts in Tanzania.

PRESENTATIONS

1. S-05-01 Institutionalizing School -based Malaria Surveillance to strengthen sub national stratification and policy in Tanzania: A decade of implementation (2014-2025)

Frank Chacky

2. S-05-02 Mapping malaria prevalence among school age children in Tanzania from 2015 to 2023 using sub-council spatiotemporal modelling

Frank Chacky

3. S-05-03 The Hidden Asymptomatic Malaria Reservoir Among School-Aged Children in Tanzania: Age, Sex and Spatial Heterogeneity Across Councils

Ms. Sarah Leonard — Ifakara Health Institute

4. S-05-04 Risk factors for malaria among school-age children in low and high transmission settings in mainland Tanzania

Agnes Mpinga

5. S-05-05 Malaria infection and stunting among school-age children in Tanzania: Evidence from two national crosssectional surveys (2023-2025)

Nyabasi Makori

NIMR Strategic Direction Towards Tanzania Development Vision 2050

BACKGROUND

The National Institute for Medical Research (NIMR) is strategically positioned to contribute to the realization of Tanzania Development Vision 2050 through the generation, coordination, and translation of high-quality health research and innovation. By strengthening research capacity, promoting evidence-based policymaking, advancing digital health technologies, fostering strategic partnerships, and supporting the development of resilient and equitable health systems, NIMR aims to address emerging and existing health challenges while improving population health outcomes. Through its commitment to scientific excellence and innovation, NIMR seeks to contribute to a healthier, productive, and prosperous society that supports Tanzania's long-term socio-economic transformation agenda.

PRESENTATIONS

1. NS-01 National Health Research Coordination and Promotion Committee (NatHReCoP)

Dr. Nyanda Ntinginya — National Institute for Medical Research

2. NS-02 National Health Research Ethics Committee (NatHREC)

Dr. Mary Mayige — National Institute for Medical Research

3. NS-03 NIMR Strategic Plan

Mr. Frederick Mahawi — National Institution for Medical Research

Towards Elimination of NTDS in Tanzania: Success stories, Challenges and Next Steps for Elimination of Onchocerciasis

BACKGROUND

The proposed symposium aims for presenters to present and discuss findings obtained from various operational research conducted recently. There are five studies conducted across foci in Tanzania, will show-case the impact made by interventions put in place by the neglected tropical diseases program and actors to fight against the disease. Specifically, the presentations will address sampling and laboratory methodologies, serology, clinical and entomology results, diagnostic challenges and solutions, and next steps towards reaching the last milestone in the elimination of OV in Tanzania. From presentations, participants will embark in discussing what plans and methods have yielded successes in some foci compared to other foci where the infection of Oncho remains either high or has decreased noticeably. Based on different transmission statuses of OV, the discussions will help in redefining context challenges across foci and consequently re-designing

evidence-based strategies for overcoming them to accelerate transmission in the country.

PRESENTATIONS

1. **S-02-01 The World Health Organization Road map for neglected tropical diseases (NTDs) 2021-2030: Will Tanzania achieve the targets?**

Clara Jones — MINISTRY OF HEALTH

2. **S-02-02 Onchocerciasis transmission has been eliminated in the Tukuyu focus; successes of its kind in Tanzania**

Akili Kalinga — National Institute for Medical Research

3. **S-02-03 Is Onchocerciasis transmission interrupted in Tunduru Focus? Stop MDA surveys.**

Peter Mabenga — National Institute for Medical Research

4. **S-02-04 Progress and challenges towards onchocerciasis elimination in the Mahenge Focus**

Vivian Mushi — Department of Parasitology and Medical Entomology, School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences, Dar es Salaam, Tanzania

5. **S-02-05 Evaluation of transmission towards the elimination of onchocerciasis in Tanzania. A case of Ruvuma focus after over two decades of mass drug administration.**

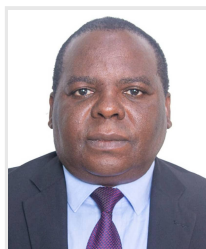
Winfrida John — National Institute for Medical Research, Dar es Salaam, Tanzania,

6. **S-02-06 Title: Onchocerciasis diagnostic challenges: novel diagnostics paving way as alternative for programmatic decision making.**

Paul Martine — National Institute for Medical Research

Conference Speakers

KEYNOTE SPEAKERS



Dr. Mursali A. Milanzi

Deputy Executive Secretary

National Planning National Planning Commission

Dr. Mursali A. Milanzi is the Deputy Executive Secretary for National Planning at the National Planning Commission, where he plays a leading role in shaping and coordinating Tanzania's long-term development agenda, including the implementation of Tanzania Development Vision 2050. An experienced development planner and economist, he previously served as Commissioner for National Planning and has held senior academic and policy leadership positions. His work focuses on national development planning, economic transformation, public-private partnerships, human capital development, and aligning sectoral priorities with Tanzania's long-term growth and prosperity goals.

PLENARY SPEAKERS



Dr. Amos Nungu

Director General

Tanzania Commission for Science and Technology (COSTECH),

Dr. Amos Muhunda Nungu is the Director General of the Tanzania Commission for Science and Technology (COSTECH), the principal advisory body to the government on all matters related to science, technology, and innovation. Prior to joining COSTECH, Dr. Nungu served as the Assistant Director of the Directorate of Science, Technology, and Innovation at the Ministry of Education, Science and Technology in Tanzania. Before that, he was a Senior Lecturer at the Dar es Salaam Institute of Technology, where he initiated, managed, and participated in numerous projects, including those funded by the European Union (FP7 & H2020), the Swedish International Development Cooperation Agency (SIDA), and the Norwegian Agency for Development Cooperation (NORAD). Dr. Nungu has served - and continues to serve - as a board member for various institutions. He is currently a board member of the Tanzania Atomic Energy Commission (TAEC) and the East African Science and Technology Commission (EASTECO). In November 2021, he was elected as the 2nd Vice Chair (Innovation) of the II Bureau of the African Scientific Research and Innovation Council (ASRIC) under the African Union. In May 2025, he was elected as a Governing Board Member of the Global Research Council (GRC) - a virtual organisation, comprised of the heads of science and engineering funding agencies from around the world, dedicated to promote the sharing of data and best practices for high-quality collaboration among funding agencies worldwide. This is a 3 years term, renewed once. Dr. Nungu holds a Ph.D. and an M.Sc. in Information Technology (Communication Systems) from the Royal Institute of Technology (KTH) in Sweden, as well as a B.Sc. in Computer Science from the University of Dar es Salaam, Tanzania.



Dr. Irene Isaka

Director General

National Health Insurance Fund (NHIF)

Dr. Irene Charles Isaka is the Director General of the National Health Insurance Fund (NHIF) and a seasoned economist with extensive experience in health financing, social protection, pension reform, and public sector leadership. She holds a PhD in Economics from the University of Dar es Salaam and has previously served as Director of Social Sectors at the East African Community, Secretary General of the East and Central Africa Social Security Association (ECASSA), and founding Director General of the Social Security Regulatory Authority (SSRA). Throughout her career, she has played a key role in advancing social security reforms, regional policy harmonization, and sustainable financing systems aimed at improving health and social protection outcomes across Tanzania and the East African region.



Prof. Nathaniel S. Sirili

Associate Professor of Health Systems and Policy

Muhimbili University of Health and Allied Sciences

Nathanael Sirili (MD, MSc, PhD) is an Associate Professor of Health Systems and Policy at the Muhimbili University of Health and Allied Sciences and a leading implementation scientist, mixed-methods researcher, and health systems expert with over 15 years of experience in research, monitoring and evaluation, policy analysis, and health systems strengthening across Sub-Saharan Africa. He graduated with a Doctor of Medicine (MD) in 2011 and a Master of Science in Health Systems in 2014 from Muhimbili University of Health and Allied Sciences. He obtained his PhD in Public Health (Health Systems) from Umeå University, Sweden, in 2018. Nathanael has extensive experience working with Ministries of Health and PMO-RALG in Mainland Tanzania and the Ministry of Health, Zanzibar, on health workforce reforms, continuing professional development, emergency care systems, digital health, and primary healthcare strengthening initiatives. He has led and evaluated health programs funded by UNICEF, GIZ, the World Bank, the World Health Organization, AMREF Health Africa, the United States Agency for International Development, the Abbott Fund, the Global Fund, and the Fogarty International Center. With over 100 publications in international peer-reviewed journals, he is widely recognized for his scholarly leadership, mentorship, and contributions to evidence-informed policy and implementation science in low-resource settings.



Prof. Thomas Nyirenda

Strategic Partnerships & Capacity Development Manager and Head of Africa Office

EDCTP

Thomas Nyirenda MD MPH Hon Prof (Public Health Medicine), is Strategic Partnerships & Capacity Development Manager and Head of Africa Office of the European and Developing Countries Clinical Trials Partnerships (EDCTP). He first trained in Medical Sciences at University of St Andrews (Scotland), then in Medicine and Surgery at St Mary's Hospital (London) and Kamuzu University of Health Sciences (Malawi), before training in Public Health at London

School of Hygiene and Tropical Medicine (London). He has 30+ years' experience of working in Clinical Medicine Practice, Public Health, Clinical Research and Health Services Management in sub-Saharan Africa. He first worked for Ministry of Health of Malawi then the World Health Organisation before joining the EDCTP in 2004. At EDCTP he has co-managed teams which have managed over 400 clinical research and capacity development projects in last 20 years, some of which have led to new treatments of HIV in children and adults, medicines against malaria in children and pregnant women, vaccines against malaria in children and treatment of other neglected illnesses such as worms infections, childhood bilharzia and sleeping sickness. He has had teaching appointments at University of Witwatersrand (South Africa), and is currently Extraordinary Professor at Stellenbosch University (South Africa) and Hon Professor at University of Pretoria (South Africa). He is one of the founders of a Non-governmental Organisation called Clinical Research Education and Management Services (CREAMS) in Malawi. More about him can be found on the following links: [linkedin.com/in/thomas-nyirenda-89600b14](https://www.linkedin.com/in/thomas-nyirenda-89600b14) / www.researchgate.net/profile/Thomas-Nyirenda-2 / www.edctp.org/about-us/edctp-secretariat/dr-thomas-nyirenda/.

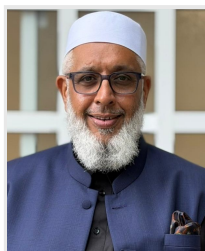


Dr. Vida Mmbaga

Medical Doctor with Public Health and Epidemiology

Ministry of Health

Dr. Vida Mmbaga is a Medical Doctor with Public Health and Epidemiology speciality currently working with the Ministry of Health in Tanzania as Assistant Director for the Epidemiology and Disease Surveillance and Control section. She is also the National IHR 2005 Focal Point (NFP) and the Program Director for the Field Epidemiology and Laboratory Training Program (FELTP). Her main area of speciality is Epidemiological Surveillance, Preparedness and Response to Public Health Emergencies. She is responsible for the coordination, preparedness for against global public health threats, supervision, monitoring, and evaluation of the surveillance activities whereby she has gained a lot of experiences in prevention and control for communicable and noncommunicable diseases, including field epidemiology and integrated disease surveillance and response; management in global public health and health systems strengthening. With over 15 years of experience, Dr Mmbaga has led healthcare delivery and public health programmes in epidemiology and disease intelligence at sub-national, national and within African region whereby she coordinates formulation and development of various infectious disease specific preparedness and response plans. She has spearheaded several initiatives that include resource mobilization for various disease programs, coordination of the international cross border collaborative preparedness and response activities including joint outbreak investigations, After Action Reviews and simulation exercises under regional collaborations with various partners. Additionally, she is coordinating the implementation of International Health Regulations (2005) to build the IHR core capacities and the development of the National Action Plan for Health Security for the prevention, detection and response to public health threats. She is the head of surveillance pillar under the National Task force for the control of Public Health emergencies. Under this role, she took lead in the successful control of a number of major outbreaks occurred in the country including COVID 19, Marburg Virus Disease in Kagera 2023 and in 2025 where she played a key role of deputy chief of operation.



Mr. Bashir Haroon

Managing Director of Shifaa

Pan African Hospital

Mr. Bashir Haroon is a distinguished healthcare investor, industry leader, and strategic thinker with more than four decades of executive leadership experience spanning healthcare, pharmaceuticals, and industrial development. As the Founder and Managing Director of Shifaa Pan African Hospital, he has played a pioneering role in advancing tertiary healthcare delivery in Tanzania by promoting internationally aligned standards in specialist care, diagnostics, and healthcare infrastructure. His leadership reflects a broader vision of healthcare transformation that positions strong institutions, local innovation, and long-term investment as central pillars of national development and health security. He has made significant contributions to pharmaceutical manufacturing and health systems strengthening through strategic investments aimed at enhancing medicine security and reducing import dependency in Tanzania and the wider region. He currently serves as Chairman of the Tanzania Pharmaceutical Manufacturers Association (TPMA), Trustee of the Pharmaceutical Society of Tanzania (PST), and Member of the UDOM Industrial Advisory Committee, where he actively promotes collaboration between industry, academia, and policymakers. Widely recognized for advocating sustainable private-sector engagement in healthcare, his work continues to support Tanzania's ambitions in pharmaceutical self-reliance, medical excellence, and resilient health systems aligned with long-term national development goals.



Mr. Benson Mcheza Kateihwa

Senior Pharmacist, Senior Drug Inspector, Public Health Specialist and GMP Inspector

Tanzania Medicines and Medical Devices Authority (TMDA)

Mr. Benson Mcheza Kateihwa is a Senior Pharmacist, Senior Drug Inspector, Public Health Specialist and GMP Inspector at the Tanzania Medicines and Medical Devices Authority (TMDA) Northern Zone with over 14 years of experience in pharmaceutical regulation, quality assurance, pharmacovigilance, and public health. He has participated extensively in GMP inspections, quality audits and pharmaceutical regulatory activities both nationally and internationally including inspections of manufacturing facilities in Tanzania, India, China and Indonesia and WHO-related trainings in Morocco and South Africa. Mr. Kateihwa holds a Master's degree in Life Sciences (Global Health and Biomedical Sciences) from the Nelson Mandela African Institution of Science and Technology and a Bachelor of Pharmacy from Rajiv Gandhi University of Health Sciences, India.



Dr. George Mugambage Ruhago

Associate Professor of Health Economics

Muhimbili University of Health and Allied Sciences (MUHAS)

George Mugambage Ruhago, PhD, is Associate Professor of Health Economics at Muhimbili University of Health and Allied Sciences (MUHAS), Dar es Salaam, Tanzania. He

earned his PhD in Health Economics from the University of Bergen, Norway (2015). He has further pursued specialised training at the University of York, the University of Geneva, and the University of Oxford in health economics, cost-effectiveness analysis, systematic review methods, and health and human rights. His research programme focuses on economic evaluation of health interventions, health financing reform, supply chain costing, equity impact analysis, and priority setting for universal health coverage. He has been a collaborator with the Institute for Health Metrics and Evaluation (IHME) on the Global Burden of Disease Study since 2014 and is co-author on landmark publications in *The Lancet* covering global mortality, DALYs, and life expectancy. His broader portfolio of more than forty peer-reviewed articles spans HIV drug resistance, sickle cell disease economics, maternal and child health, direct health facility financing, and results-based financing in Tanzania. Prof. Ruhago has served as lead consultant or subject-matter expert on engagements for UNAIDS, USAID, the Global Fund, UNICEF, UNFPA, the World Bank, the Guttmacher Institute, and the Government of Tanzania. He has led national-level work on Tanzania's HIV Sustainability Roadmap, health commodity financing, supply chain efficiency reviews in Tanzania, Ethiopia, Malawi, and Zanzibar, and the costing of HIV, tuberculosis, malaria, sickle cell, and maternal health services. At MUHAS he teaches applied economic evaluation, health financing, equity impact analysis, health technology assessment, and monitoring and evaluation, and has supervised more than forty postgraduate dissertations



Dr. George PrayGod

Chief Research Scientist

National Institute for Medical Research

Dr. George PrayGod is a Chief Research Scientist at the National Institute for Medical Research (NIMR), Tanzania, and a distinguished clinical epidemiologist with extensive experience in public health research, nutrition, infectious diseases, and non-communicable diseases. He holds a Doctor of Medicine (MD) degree, a Master of Science in Epidemiology and Biostatistics from the University of the Witwatersrand, South Africa, and a PhD in International Nutrition and Health from the University of Copenhagen, Denmark. Over the course of his career, he has led and contributed to numerous national and international research initiatives addressing HIV/AIDS, tuberculosis, diabetes, nutrition, and health systems strengthening, generating evidence that has informed policy and practice in Tanzania and beyond. Dr. PrayGod has successfully secured and managed major research grants from leading international funding agencies, including DANIDA, EDCTP, the UK Medical Research Council, USAID, and TB Alliance. He has served in several senior leadership positions within NIMR and has authored more than 80 peer-reviewed scientific publications. In addition to his research leadership, he is actively involved in mentoring young scientists and postgraduate students, contributing significantly to research capacity development in Tanzania. His work continues to advance evidence-based healthcare, scientific innovation, and the strengthening of health research systems across Africa.



Prof. Gibson Kibiki

Executive Secretary

East African Health Research Commission (EAHRC)

Prof Gibson Kibiki, MD, M.Med, PhD, PG Dipl Endosc, is a retired professor of medicine, currently based in the United Kingdom. He served as a Professor of Medicine and Consultant Physician cum Endoscopist at KCMC University, Tanzania; Adjunct Professor of Medicine at Radboud University, The Netherlands; and Adjunct Professor of Global Health at the University of Virginia, United States of America. He is the Former CEO of the Africa Research Excellence Fund, London, United Kingdom; Former and Founding CEO of the East African Health Research Commission of the East African Community, Bujumbura, Burundi, and Former and Founding Director of Kilimanjaro Clinical Research Institute, Kilimanjaro, Tanzania.



Dr. Honorati Masanja

Chief Executive Director

Ifakara Health Institute

Dr. Honorati Masanja is the IHI sitting Chief Executive Director. His professional background is in statistics and epidemiology. He holds a PhD in Epidemiology and has extensive experience in data management, clinical trials, design, and evaluation of large maternal and child health programs. Dr. Masanja joined the Institute in 1992. He obtained his PhD in Epidemiology from the Swiss Tropical and Public Health Institute, University of Basel, in 2006. Over the last 25 years, he has led the successful acquisition and implementation of national and regional projects whose direct impact on strengthening Tanzania's health system is still seen today. Having participated in the establishment of the Rufiji Health and Demographic Surveillance System (RHDSS), Dr. Masanja became the Principal Investigator for the SAVVY project from 2009–2014, a step in Tanzania's shift towards evidence-based planning and enabling health-sector evaluation. Dr. Masanja's scientific engagement spans across borders. Having published extensively in international journals and books, he is also an editorial reviewer for the MRC Joint Health Systems Research Initiative, and a member of Tanzania's National eHealth Steering Committee and the Steering Committee for Monitoring and Evaluation. His experience in training post-doctoral, doctoral, and master's students in Tanzania led to his appointment in 2013 as an Adjunct Professor in the School of Life Sciences at the Nelson Mandela African Institution of Science and Technology.



Dr. Kijakazi Mashoto

Principal Research Officer

National Institute for Medical Research

Kijakazi Obed Mashoto is a Public Health Consultant and Certified Technology and Innovation Support Officer. She serve as Principal Research Officer at the National Institute for Medical Research



Prof. Ladslaus Laurent Mnyone

public health scientist, academic leader and Science, Technology and Innovation (STI) strategist

Prof. Ladslaus Laurent Mnyone is a public health scientist, academic leader and Science, Technology and Innovation (STI) strategist with over two decades of experience in research, policy development and institutional transformation. He holds a PhD in Medical Entomology from Wageningen University in the Netherlands, a Master of Preventive Veterinary Medicine and a Bachelor of Veterinary Medicine from Sokoine University of Agriculture. His expertise spans infectious diseases, disease vector control, zoonotic diseases and translational research. Prof. Mnyone has accumulated nearly 12 years of leadership experience, including service as Deputy Director and Director of the Sokoine University of Agriculture Pest Management. Centre, approximately two years as Assistant Director for Research and Development, and nearly four years as Director of Science, Technology and Innovation in the Ministry of Education, Science and Technology. In his current role, he has contributed to the development of major national initiatives, including the National Technology Roadmap 2050, the National STI Masterplan, the National STI Financing and Incentivization Strategy, the National Diaspora Engagement Strategy and the National Digital Education Strategy. He serves on more than six national boards, councils and committees and has published over 60 scientific articles in peer-reviewed journals. His work is dedicated to advancing research and development and STI as key drivers of Tanzania Development Vision 2050 and the country's broader socio-economic transformation.



Dr. Mariam Noorani

head of research and the Chair of Department of Paediatrics

Aga Khan University (AKU) and Aga Khan Health Service, Tanzania (AKHST)

Dr. Mariam Noorani is the head of research and the Chair of Department of Paediatrics at the Aga Khan University (AKU) and Aga Khan Health Service, Tanzania (AKHST). She is a paediatrician and International Board Certified Lactation Consultant (IBCLC) and holds a Master's degree in Medical Education from the University of Edinburgh. She is also a Senior Fellow of the Higher Education Academy (SFHEA) and is a research fellow with the Aga Khan University Institute of Global Health and Development (IGHD) Women in Science Program. She is the founding chair of the Department of Paediatrics at AKU in Tanzania where she established the residency training program. Under her leadership, the Department has expanded into a comprehensive unit providing the highest standards of care to sick children, including a well-established neonatal unit caring for sick and premature newborns. In an effort to improve care for children in Tanzania, she led the way to establish a Master's program to train paediatricians at the Aga Khan University which has now graduated its first group of trainees. Her passion is in supporting, promoting and advocating for breastfeeding as the optimal nutrition for all babies. Her work as a lactation consultant has led to the establishment of breastfeeding clinics and she was recently awarded a grant from the American Academy of Paediatrics through which community level breastfeeding support groups are being established in partnership with the local governments. She actively supports working women to continue exclusive breastfeeding upon return to work and advocates for their rights in the workplace. Her leadership in this area has led to the development of a short course to strengthen lactation

support skills of health workers. She has developed partnerships with schools and communities to promote child health and nutrition and works with adolescents on healthy behaviours and lifestyles. She has also championed the cause for children with rare diseases in Tanzania and is a board member of the Ali Kimara Rare Disease Foundation (AKRDF) and the Tanzania Human Genetics Organisation (THGO). She leads the first aid program that aims to train parents, teachers and caregivers about childhood emergencies and first aid responses that can save the lives of children. Dr. Mariam is actively involved in research and has published several papers and supervised many young researchers in their research work. She was awarded a grant to strengthen research capacity through which many doctors and nurses were trained in advancing their research skills. Her vision is to work with partners to establish a centre of excellence for child health that will engage in clinical care, research and training to improve the health and well-being of children in Tanzania.



Dr. Mary Mayige

Principal Research Officer and Director of Research Information and Regulatory Affairs
National Institute for Medical Research (NIMR).

Dr Mary Mayige is a Principal Research Officer and Director of Research Information and Regulatory Affairs at the National Institute for Medical Research (NIMR). A graduate of Makerere University, (MBchB), Muhimbili University of Health and Allied Sciences (MPH), and Newcastle University (PhD), as well as additional professional training from institutions in Tanzania and abroad. Her work spans research, clinical practice, and consultancy, with a focus on non-communicable diseases and their interaction with infectious diseases, particularly HIV. She has led major national and international research initiatives, including the STEPs Surveys of NCD risk factors, Tanzania NCDI, and PEN PLUS, and has contributed to key national policy documents such as the National Non-Communicable Diseases Strategic Plans, the National Multi-Sectoral Nutrition Action Plan II, and the Health Sector Strategic Plan V. Dr Mayige has also held several leadership and advisory roles in professional and national bodies, serves as a visiting lecturer and postgraduate supervisor, and has authored numerous peer-reviewed publications.



Dr. Mary Mwanyika Sando

Chief Executive Officer
Africa Academy for Public Health (AAPH)

Dr. Mary Mwanyika Sando is the Chief Executive Officer of the Africa Academy for Public Health (AAPH), a leading African institution dedicated to advancing public health research, implementation science, leadership development, and evidence-informed policymaking. A medical doctor by training, she holds a Doctor of Medicine (MD) degree from the University of Dar es Salaam and a Master of Public Health (MPH) in Global Health and Population from Harvard T.H. Chan School of Public Health. With nearly two decades of experience in public health, she has held senior technical and leadership positions with organizations including UNICEF and Management and Development for Health (MDH), leading programmes in maternal, newborn, child and adolescent health, nutrition, mental health, and health systems strengthening. At AAPH, she spearheads initiatives that bridge research, policy,

and practice across Africa, while co-leading the Africa Research Implementation Science and Education (ARISE) Network in partnership with Harvard University, connecting more than 20 institutions across 10 sub-Saharan African countries. Dr. Sando is also the President of the Medical Women Association of Tanzania (MEWATA) and serves on international advisory boards, including the Charité Center for Global Health and The Lancet Regional Health – Africa. Widely recognized for her commitment to strengthening African scientific leadership and translating evidence into impact, she is a respected voice in public health, implementation science, capacity building, and health systems transformation across the continent.



Dr. Mosoka Fallah

Director of the Science and Innovation Directorate
Disease Control and Prevention (Africa CDC)

Dr. Mosoka Fallah serves as Director of the Science and Innovation Directorate at the Africa Centres for Disease Control and Prevention (Africa CDC), where he leads efforts to strengthen health security, research, and innovation across Africa. A globally recognized public health expert, immunologist, and epidemiologist, he played a pivotal role in Liberia's Ebola response and previously served as Director General of the National Public Health Institute of Liberia (NPHIL). Dr. Fallah is widely known for advancing Africa-led research, clinical trials, local manufacturing of medical products, and strategic partnerships that enhance the continent's capacity to prevent and respond to emerging health threats.



Dr. Nyanda Elias Ntinginya

Director of Research Coordination and Promotion
National Institute for Medical Research

Dr. Nyanda Elias Ntinginya is the Director of Research Coordination and Promotion at the National Institute for Medical Research (NIMR), Tanzania, where he leads institutional research coordination, capacity strengthening, and promotion of strategic research partnerships. A physician-scientist and public health researcher, he has extensive experience in clinical research, infectious diseases, implementation science, and health systems research. Over his career, he has contributed to the design and management of multicountry research programmes, mentorship of early-career researchers, and translation of research evidence into policy and practice. Dr. Ntinginya is widely recognized for his leadership in strengthening Tanzania's clinical research ecosystem, fostering collaboration across government, academia, and international partners, and advancing evidence-informed approaches to health system improvement and pandemic preparedness.



Dr. Rashid Mfaume

Director of Health, Social Welfare, and Nutrition Services
Prime Minister's Office, Regional Administration, and Local Government.

Dr. Rashid Mfaume, is a Public Health specialist with 21 years of experience in Primary Health Care, currently serves as the Director of Health, Social Welfare, and Nutrition Services at the Prime Minister's Office, Regional Administration, and Local Government.

He holds a bachelor's degree in Doctor of Medicine, a Master of Public Health, and a Master of Business Administration. With 7 years of experience in Regional Health management and 12 years as a District Medical Officer, Dr. Mfaume has a deep understanding of healthcare challenges and solutions at various levels. He is also serving as a Member of Board of Trustees for Medical Stores Department (MSD). Throughout his career, Dr. Mfaume has made significant contributions to public health in Tanzania. He has led successful initiatives in Primary Health Care system Strengthening including Sustainable Health Care Financing. his expertise and leadership have been instrumental in advancing public health in the country



Dr. Salum Ally Manyatta

Assistant Director for One Health

Prime Minister's Office

Salum Ally Manyatta is a Tanzanian registered medical doctor with public health specialty with over two decades of experience across local government and regional authorities. Currently working as the Assistant Director for One Health at the Prime Minister's Office in Dodoma. He provides strategic leadership on interdisciplinary, multi-sectoral cooperation and spearheads the implementation of the National One Health Strategic Plan and National Action Plan for Health Security to coordinates multi-sectoral efforts to tackle complex challenges spanning human, animal, and environmental health. The area of coordination includes; - climate change health threats, emerging and re-emerging health threats, antimicrobial resistance, zoonotic diseases. Food safety threats, biosafety and biosecurity threats and environmental health threats. Before joining the Prime Minister's Office, he served as a District Medical Officer and Regional Medical Officer, where he was responsible for managing public health interventions, maintaining social welfare, and preventing disease outbreaks. Core Responsibilities & Expertise • One Health Coordination: Leads the One Health Section in aligning human, animal (livestock and wildlife), agricultural, and environmental sectors to detect and respond to disease outbreaks. • Public Health Leadership: Utilizes his extensive background from working as Regional Medical Officer and District Medical Officer to manage public health risks and drive National One Health Strategic Plan. • Emergency preparedness and Disease Prevention: Oversees the implementation of frameworks for high-priority zoonotic diseases, emerging and re-emerging health threats, climate change health threats and antimicrobial resistance (AMR) mitigation



Prof. Sayoki Mfinanga

NIMR Chief Research Scientist Fellow, Tanzania

National Institute for Medical Research

Professor Sayoki Godfrey Mfinanga is a clinical trialist, public health specialist and epidemiologist at the National Institute for Medical Research (NIMR) Muhimbili Medical Research Centre, Tanzania, where he serves as Chief Research Scientist fellow. He also holds professorial appointments and affiliations in epidemiology and global health, including with Kampala International University in Tanzania, the Liverpool School of Tropical Medicine, University College London, and the Nelson Mandela African Institution of Science and Technology. His work spans more than 15 years in TB/HIV, advanced HIV disease, non-communicable diseases, zoonoses, vaccine research, clinical trials

and implementation research across Africa. He has led and co-led multicentre studies and research capacity-building networks, including EDCTP-supported platforms, RESPOND-Africa, Afrique One ASPIRE/REACH, and the East African Consortium for Clinical Research TB Node. His research has contributed to national and WHO guidelines, including on TB/HIV and cryptococcal disease, and he has authored more than 270 peer-reviewed publications. Prof. Mfinanga is also a committed mentor of MSc, PhD and postdoctoral researchers, with a strong focus on strengthening African scientific leadership and translating evidence into policy and practice.



Mr. Tumainiel Macha

Director of Policy, Research and Innovation
Ministry of Health

Over 19 years' experience working with Government of Tanzania as Principal Economist. Currently I am Assistant Director Policy, Research and Innovation - Ministry of Health, (Head Office). Expertise in; budget preparation, Speech writing, Health Financing, Monitoring & Evaluation, negotiation techniques, Entrepreneurship skills, Project implementations/planning. Holding Master's in Business Administration -Cooperate Management, and Bachelor of Science Economics - Project Planning and Management

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