MRC/UVRI and LSHTM Uganda Research Unit

Medical Research Council

Uganda Virus Research Institute

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

A Report of the Inaugural Research Dissemination Conference, 2025

Executive Summary

The MRC/UVRI & LSHTM Uganda Research Unit, in collaboration with Uganda Virus Research Institute (UVRI), has been instrumental for over 35 years in advancing infectious and non-communicable disease research, shaping health policies, and driving life-saving interventions in Uganda and globally. The Inaugural Joint MRC/UVRI & LSHTM Uganda Research Unit and UVRI Research Dissemination Conference convened leading scientists, policymakers, and stakeholders in global health at Speke Resort Munyonyo from March 11-13, 2025. Under the theme "Building on our Past Discoveries, Paving the Way for a Healthier Future," the conference aimed to accelerate research collaboration and innovation for impactful health outcomes.

Keynote addresses, expert panels, and interactive discussions focused on key health challenges for Uganda, the region and beyond including emerging infections, vaccine development, and non-communicable diseases. Lively panel discussions also explored the critical role of community engagement in health research and the intersections of climate change and AI with health. The conference also emphasised interdisciplinary collaboration to enhance research impact. Distinguished speakers highlighted future directions in HIV research and vaccine innovations and emphasized the importance of policy integration and global partnerships in advancing public health.

The conference served as a catalyst for collaboration, fostering dialogue among researchers, policymakers, industry experts, and communities to generate actionable insights and propel future research. It emphasized the role of evidence-based decision-making, strategic funding, and innovative thinking in addressing global health challenges.

In this report we summarise the key emerging issues and outcomes from the proceedings of the three-day event.

Proceedings


The conference opened with a unified call to action: to strengthen partnerships, accelerate innovation, and centre evidence in tackling global health challenges.

Speakers across government, academia, and research institutions converged on a shared vision that health equity, regional resilience, and scientific excellence must be pursued in tandem.

A strong emphasis was placed on collaboration as the foundation for impactful health research. Her Excellency Tiffany Kirlew, the British Deputy High Commissioner to Uganda, underscored the need for regional vaccine manufacturing and medical innovation to address global health inequities, particularly as the world contends with emerging pathogens, the rise of non-communicable diseases, and strained health systems. Echoing this, Uganda's Minister of Health, Hon. Dr. Jane Ruth Aceng, reaffirmed the government's commitment to supporting research that strengthens emergency preparedness and public health interventions, citing Uganda's ongoing laboratory surveillance for Ebola as a powerful example.

The importance of science-informed policy and equitable partnerships was another recurring theme. Professor Liam Smeeth, Director of LSHTM, urged for stronger connections between research and policymaking, grounded in trust and regional relevance. This was reinforced by Dr. Samuel Okware of the Uganda National Health Research Organization, who called for greater investment in training and outbreak readiness to future-proof the continent's health systems.

Leaders of the host institutions spoke to the role of such convenings in catalysing progress. Professor Moffat Nyirenda, Director of the MRC/UVRI & LSHTM Uganda Research Unit, described the conference as a springboard for new collaborations that could drive enduring

impact in global health. UVRI Director Professor Pontiano Kaleebu highlighted its value in creating vital networks among researchers, policymakers, and other stakeholders, turning knowledge exchange into collective action.

The event featured two compelling keynote addresses that explored critical challenges and advancements in global health.

HIV Innovations, Challenges, and Interconnections

Dr. Paula Munderi reflected on the state of the global HIV response, drawing insights from the latest UNAIDS report. While treatment programs have demonstrated success, she highlighted persistent challenges such as unequal access, stigma, discrimination, and gender-based violence, which continue to hinder progress. Of particular concern is the rising number of infections due to failed prevention during pregnancy, underscoring the need for stronger maternal health interventions.

Beyond clinical treatment, Dr. Munderi advocated for a broader, integrated approach to HIV response. She emphasized the importance of enabling policies, community-led interventions, and the integration of HIV services with tuberculosis, maternal health, and non-communicable disease programs. However, she warned that declining global financial support, coupled with insufficient domestic funding, threatens the sustainability of HIV interventions.

Looking ahead, she stressed that the upcoming global AIDS strategy must embrace innovation, inclusivity, and new partnership models to sustain progress. She left the audience with critical questions about the future of HIV response, urging reflection on the role of emerging interventions, the feasibility of an effective vaccine, and the need for transformative approaches in a rapidly evolving global health landscape.

Will New Vaccines Lead to Malaria Elimination?

Professor Adrian Hill of the Jenner Institute at Oxford University addressed the pressing challenge of malaria, which remains a leading cause of mortality, particularly among young children in Africa. He highlighted the recent advancements in malaria vaccines, including:

- RTS,S (GSK) – The first malaria vaccine, approved in 2021, with approximately 50% efficacy.
- R21 (Oxford) – A newer vaccine with higher efficacy (~77%) and improved durability, offering key advantages such as lower dosage requirements, cost-effectiveness, and easier manufacturability.

Professor Hill explored emerging strategies to enhance malaria vaccine effectiveness, including combining R21 with RH5, a blood-stage malaria vaccine that has shown promising efficacy in early trials. He also discussed the potential of transmission-blocking vaccines to reduce parasite spread in mosquito populations. Another promising avenue is integrating vaccines with long-lasting anti-malarial drugs, such as V371, which is currently in Phase 1 trials in the UK. A single injection of this drug could provide three to six months of protection, and when combined with R21, could significantly curb malaria transmission.

However, achieving malaria elimination will require an estimated $15 billion in funding. Professor Hill outlined the substantial economic benefits of eradication, including an expected $127 billion boost in global GDP by 2030, driven by a healthier workforce, reduced absenteeism, and lower healthcare costs. He stressed that no single donor can bear the financial burden alone—malaria elimination will require a global funding consortium, with governments, NGOs, and private investors collaborating to ensure the large-scale deployment of vaccines and integrated prevention strategies.

Two short talks explored critical challenges and emerging opportunities in research and innovation, and enabled discussions to strengthen research ecosystems.

The COVID-19 Pandemic in Malawi: Contextualising a Global Problem

Dr. Kondwani Jambo shared findings from his team's research on COVID-19 in Malawi, focusing on immunological responses, particularly in relation to the AstraZeneca vaccine and the concept of hybrid immunity (immunity developed through both infection and vaccination).

Key discoveries included:

- Early surveillance studies revealed a much higher seroprevalence of COVID-19 than initially expected, indicating broad exposure despite lower reported case numbers.
- Severe COVID-19 cases in Malawi presented differently than those in Western countries, and symptoms varied across variants, with Omicron showing distinct characteristics.

- The AstraZeneca vaccine, in individuals with prior infection, induced strong and long-lasting immune responses, even with a single dose. Repeated exposure to the virus further boosted and maintained immunity.
- Research on lung fluid samples confirmed that blood-based tests could reliably reflect lung immunity, supporting their use in future studies.

Key Emerging Issues

Dr. Jambo emphasized that Malawi's population demographics likely played a role in the observed lower severity of COVID-19. His findings reinforced the importance of hybrid immunity, the effectiveness of adenovirus-based vaccines, and the need for ongoing research to monitor the long-term effects of repeated exposure and emerging variants.

Moving forward, researchers aim to investigate the long-term durability of hybrid immunity, examine differences in COVID-19 clinical presentations across populations, study adenovirus seroprevalence and its impact on vaccine responses and develop more sensitive methods for measuring T-cell responses in the lungs.

Opportunities and Challenges of Funding Research in Africa

Dr. Thomas Kariuki, Founding Director of the Science for Africa Foundation, delivered a powerful address on the challenges and opportunities in funding research across the continent. He emphasized that grant application processes are often complex and inaccessible, limiting opportunities for early-career researchers and underfunded institutions. Without structural reforms, the system risks reinforcing inequalities rather than fostering inclusive scientific progress.

He highlighted a major issue in funding models—the tendency to prioritize low-risk projects, which stifles innovation. To unlock discoveries, there must be greater support for high-risk, high-reward research. He also pointed out the rigidity of traditional grants, which can limit adaptability, with more flexible funding models, such as unrestricted grants, potentially allowing allow researchers to pursue unconventional but critical directions.

Financial governance remains a key challenge, weakening the ability of African institutions to secure and manage large grants. Strengthening financial management systems, he argued, is essential for credibility and attracting sustained investment. Moreover, the short-term nature of many grants fails to support the kind of long-term commitment required for major scientific breakthroughs. Sustainable, long-term funding is crucial for deeper advancements and continuity in research.

Dr. Kariuki also addressed the pressing need for greater investment in research and development. African governments and the private sector continue to allocate insufficient resources, leaving a significant funding gap. Stronger advocacy is needed to drive increased investment. Beyond funding, he stressed the importance of science communication. A disconnect between research and public

understanding weakens policy impact and societal engagement. Training journalists and investing in public outreach can amplify research visibility and influence.

He concluded with a call to action, urging scientists to step forward, raise their voices, and actively participate in shaping the future of research in Africa. When science is underfunded or under attack, it is not just researchers who suffer, but also the communities that rely on medical advancements, clinical trials, and scientific solutions to pressing challenges. Strengthening advocacy for research funding is not just a necessity, it is a responsibility to ensure that science continues to be a force for progress and development across Africa.

Three interactive panel discussions tackled crucial contemporary challenges in research: ***Community Engagement, Climate Change and Health, and Leveraging Artificial Intelligence for Biomedical Research in Africa****.*

Community Engagement: Key Challenges and Strategies

Key areas included co-creation in research, community, engagement during health crises, the role of community engagement in ensuring culturally sensitive and respectful research practices, and role of community engagement in translation of research findings into practical solutions and policies.

A significant concern raised was the shift from misinformation to deliberate disinformation, requiring researchers to actively provide quality, accessible, and community-driven information. The role of trusted messengers was emphasized, with innovative solutions like research site tours helping to counter misinformation. Engaging beyond traditional Community Advisory Boards (CABs) and leveraging social media and media partnerships were also seen as critical to broadening outreach.

The discussion highlighted the importance of empathy and inclusivity, particularly in engaging marginalized groups such as people with disabilities. Researchers were encouraged to integrate disability considerations into study designs and leverage research champions to ensure participation.

Sustained and meaningful engagement was another recurring theme. Community engagement should not be limited to the study period, but rather be an ongoing, long-term strategy to prevent fatigue and build trust. Best practices included involving community members in audits, promoting human rights awareness, and training researchers in Good Participatory Practice (GPP).

The lack of investment in linking CAB members with their communities was a noted gap, with calls for better dissemination strategies and increased collaboration with media outlets to bridge the knowledge divide. Networking and advocacy efforts should also include educating research participants on their rights and ensuring inclusive communication across diverse funding landscapes.

Climate Change and Health

Gendered impacts of climate change, the impact of climate change on infectious and non-communicable diseases, and changes in disease risk patterns were key topics that were discussed.

The discussion highlighted the importance of prioritizing climate adaptation over mitigation, ensuring that interventions are practical and responsive to immediate challenges. A fair and equitable transition must also be cost-effective, balancing economic feasibility with sustainability. Additionally, improving the science of attribution is critical, as not all outcomes can be solely linked to climate change. With a warmer climate storing more energy in the atmosphere, it becomes even more urgent to integrate health into national climate policies, mobilize climate funding, and strengthen government and multisectoral collaborations. Lastly, efforts to mitigate climate change must place vulnerable populations at the center, ensuring that adaptation strategies are inclusive and effective in addressing those most at risk.

Leveraging Artificial Intelligence (AI) for Biomedical Research in Africa

Discussions on artificial intelligence (AI) and digital health were framed by a shared urgency to ensure that technological advances genuinely serve Africa's public health needs. Participants explored how computational tools are increasingly being harnessed to improve access to and quality of primary healthcare, with predictive analytics already enhancing disease surveillance and outbreak response. However, they noted that while AI holds immense potential, its application in low-resource settings presents unique challenges, from infrastructure limitations to the lack of context-specific data.

A consistent thread across the panel was the need for ethical, locally grounded AI. Delegates emphasized that fairness in AI systems must be measurable, with tools such as TruthfulQA and BLUE MP cited as examples of how bias can be assessed and mitigated before deployment. Concerns were raised about the underperformance of AI models trained on Western datasets, especially in African healthcare and genomics. This challenge has spurred regional initiatives like H3Africa and DSI Africa, which are working to improve AI accuracy and relevance by integrating African data into training sets.

Safeguarding African genomic data emerged as a critical issue. There was consensus that robust legal and governance frameworks are urgently needed to protect against data exploitation and ensure that local communities benefit from genomic research. As automation and AI adoption accelerate, participants also highlighted the risk of job displacement. However, rather than viewing this as an inevitable outcome, the conversation shifted toward opportunity, particularly the potential for strategic reskilling and the creation of new, AI-supported roles within health systems.

Policy discussions centered on ensuring data sovereignty and avoiding technological dependency. There was a strong call for investment in local AI infrastructure, talent development, and innovation hubs to anchor Africa's role not as a consumer, but as a contributor to global AI development. Forward-looking revenue-sharing models and regulatory mechanisms were proposed to ensure that Africa retains control over the value generated by its data and intellectual capital.

Plenary sessions consisted of a diverse range of speakers, and provided an engaging platform for thought leaders, experts, and key stakeholders to share and discuss critical issues, explore emerging trends, and offer practical solutions that will shape the future of research.

Session One: Navigating the Future of HIV – Innovations, Challenges, and Interconnections

Session 1 delved into key aspects of HIV research, prevention, treatment, and preparedness for emerging health threats. Through four insightful presentations, *Understanding the Uganda HIV Epidemic; Pioneering HIV Prevention Research: Advancing Solutions for Africa; Pioneering HIV Treatment Research: Advancing Solutions for Africa;* and *The Next Wave: Preparing for Emerging and Re-Emerging Health Threats*, the session highlighted Uganda's HIV epidemic, ground breaking advancements in prevention and treatment, and the critical need for global health preparedness.

Key Emerging Issues

The discussion highlighted key challenges and opportunities in HIV treatment and cure research. Bone Marrow Transplants (BMTs), while a potential pathway for an HIV cure, present significant risks due to the immunosuppressive effects of chemotherapy, which leave patients vulnerable to infections. Additionally, past experiences with AZT monotherapy revealed high mortality rates, driven by drug resistance, toxicity, and limited treatment durability. Despite these challenges, Uganda has the capacity to perform BMTs, though further investment and specialized expertise are required to optimize their implementation.

Looking ahead, several critical questions must be addressed to advance HIV research and improve outcomes. These include accelerating progress toward the 95-95-95 targets by 2030, optimizing the rollout of injectable ART for both treatment and prevention, and identifying targeted interventions to reduce HIV incidence among key populations, particularly adolescent girls. In addition, there is a pressing need

to enhance strategies for managing HIV co-morbidities, deepen understanding of transmitted viruses to advance cure research, and explore vaccine development approaches that go beyond germline targeting for greater efficacy.

Session Two: Vaccines and Immunity – Bridging Innovation and Equitability

Vaccine development is a cornerstone of global health, yet Africa faces a significant paradox: despite bearing a high burden of infectious diseases, it produces only a small fraction of the vaccines it needs. This session explored ongoing efforts to bridge this gap through local vaccine production, immunogenicity research, clinical trials, and community engagement while addressing key challenges such as accessibility, public trust, and sustainability. Presentations included: *Development of vaccines for Africa in Africa, Development of vaccines for Africa in Africa-Uganda context, vaccine trials at MRC/UVRI and LSHTM Uganda Research Unit, participant and public perspectives on vaccines and vaccine research: studies at MRC/UVRI and LSHTM Uganda Research Unit, understanding participant and public perspectives on vaccine research: a perspective from the region*.

Key Emerging Issues

As Africa advances in vaccine production and research, several challenges must be addressed to ensure long-term success. Regulatory harmonization remains a key priority, with the African Medicines Agency (AMA) working to streamline approval processes. The transition from research to large-scale production is both costly and complex, requiring significant investment in technology transfer and Good Manufacturing Practices (GMP). Additionally, public confidence in locally manufactured vaccines must be strengthened by actively combating misinformation and skepticism.

This raises critical questions for the future:

- How do different vaccine platforms navigate GMP transition challenges?

- What are the most effective strategies for addressing public skepticism?
- How can data independence be ensured in vaccine trials?
- What role does social media misinformation play in vaccine hesitancy?
- Do vaccine stock outs contribute to reduced public trust and uptake?

Session 3: Addressing the Increasing Burden of Non-Communicable Diseases in Low-Resource Contexts

The session provided critical insights into the rising burden of non-communicable diseases (NCDs) in low-resource settings, with a particular focus on Africa. It featured four key presentations exploring the epidemiological transition, unique disease manifestations, healthcare challenges, and innovative interventions for improved disease management. Topics included: *Mapping chronic infections, Unique Manifestations of diabetes in sub-saharan Africa: implications for diagnosis and management, Infection+Distress: bridging the mental health treatment gap in Africa, Is Athsma in Africa the same as Asthma in the western world? Key concepts from our Asthma research among children and adolescents in Uganda.*

Key Emerging Issues

The session concluded with key recommendations aimed at improving NCD management in Africa. These included the need for large-scale research to better understand the unique presentations of diabetes and asthma in the region, the development of region-specific diagnostic and treatment guidelines, and the strengthening of healthcare infrastructure to support chronic disease care.

Additionally, expanding mental health services and integrating them into general healthcare, improving public awareness and community engagement, and advocating for policy changes to ensure sustainable healthcare funding and access to essential medications.

Three interactive breakout sessions focusing on viral pathogens, vaccine research, and non-communicable diseases (NCDs) provided a platform for in-depth discussions on diverse methodologies, emerging research findings, and collaborative approaches to strengthening science and public health responses. Below is a summary of key emerging issues from each session

Viral Pathogens

Discussions on viral pathogens highlighted the need for robust, sustained surveillance systems to better understand transmission dynamics and inform early response. Delegates reflected on recent findings that highlight the persistence of Ebola virus in recovered individuals, with cases documenting detectable virus in breast milk and cerebrospinal fluid long after clinical recovery. This spurred calls for further research into the long-term implications for transmission, particularly in vulnerable populations.

Uganda’s virus surveillance efforts, guided by a nationally approved protocol, were recognised as a strong foundation. However, participants noted that current activities remain concentrated in high-risk areas such as Kampala, and advocated for expanding surveillance reach to encompass a wider range of hospitals and communities, thereby enhancing the country's preparedness across geographic regions.

The session also explored the complexity of co-infections, especially involving HIV and hepatitis B, and their implications for treatment and control strategies. Ongoing studies on cross-immunity prompted rich discussion on whether prior viral exposures might offer some level of protection against related pathogens, an area flagged for further investigation.

Genomic technologies were acknowledged as transformative in enhancing predictive capacity, with scientists reporting on the use of pseudoviruses and safe culture techniques to study virus evolution and spillover risks from animal to human populations. These discussions seamlessly connected to the broader One Health framework, where advances in veterinary pathogen surveillance are contributing to early detection of zoonotic diseases and enabling cross-sectoral responses.

Seasonal trends in influenza, alongside ongoing COVID-19 monitoring, were also reviewed, with participants reflecting on the importance of integrating insights from these trends into national public health planning. Conversations culminated in a shared recognition that proactive, interdisciplinary approaches are vital, not only to track known viruses, but also to identify and characterise emerging zoonotic threats before they become major outbreaks.

Vaccine Research

Breakthroughs in tuberculosis (TB) research were a central focus, particularly the identification of biomarkers for subclinical TB. Researchers highlighted promising progress in biomarker discovery, while underscoring the need for further validation to ensure specificity and reliability in diverse populations. The potential for developing point-of-care diagnostics based on these markers was met with optimism, with early detection seen as critical to curbing transmission and improving outcomes.

Building on Uganda’s experience in managing Ebola outbreaks, discussions turned to strategies for engaging frontline pandemic responders in vaccine trials. This model of inclusive, context-sensitive research design was presented as a benchmark for future trial implementation in low-resource settings.

Looking ahead, participants outlined key priorities in vaccine research. These included investigations into the waning immunity of the measles vaccine, with ongoing studies assessing whether booster doses may be warranted. Improving vaccine potency testing in peripheral health facilities was also raised, particularly where cold-chain systems remain inconsistent — a gap that threatens vaccine efficacy at the last mile.

The recent introduction of the malaria vaccine in Uganda offered a timely opportunity for operational studies to examine real-world effectiveness, community uptake, and system readiness. Such evaluations, it was agreed, are essential to inform scale-up and policy decisions.

A forthcoming controlled human challenge trial for TB marked a milestone in the country’s research landscape. Plans to integrate skin biopsy studies to assess immune responses reflected a commitment to generating high-resolution data on host-pathogen interactions. The

collective ingenuity and resilience of Ugandan scientists in navigating resource constraints to establish these sophisticated research models drew widespread recognition and admiration.

Non-Communicable Diseases (NCDs)

Key discussions on NCDs emphasized the need for greater policy engagement, including:

- Developing accessible policy briefs to inform decision-making.
- Advocating for increased funding to support large-scale NCD research.

To improve early detection and management, researchers called for expanded community and facility-based screening programs, leveraging digital health tools for continuous monitoring.

Integration of NCD services into routine healthcare remains a priority, with a focus on training lower-level healthcare workers to manage common cases. A multisectoral approach was encouraged, involving agriculture, education, and urban planning to promote healthier lifestyles.

Public awareness campaigns remain essential to encouraging early screening and lifestyle changes, while African genomic research must be expanded to enhance understanding of genetic influences on NCDs.

Future research will explore:

- The role of polygenic risk scores in precision medicine.
- Gene-environment interactions in cardiometabolic diseases.
- The impact of genomic factors on mental health disorders.

The need for structured mental health interventions for Ebola survivors and their families was emphasized. Recommendations included:

- Training healthcare workers in psychological first aid and trauma-informed care.
- Strengthening community sensitization to combat stigma.
- Developing economic reintegration programs for survivors.
- Conducting long-term research on the psychological effects of Ebola outbreaks.

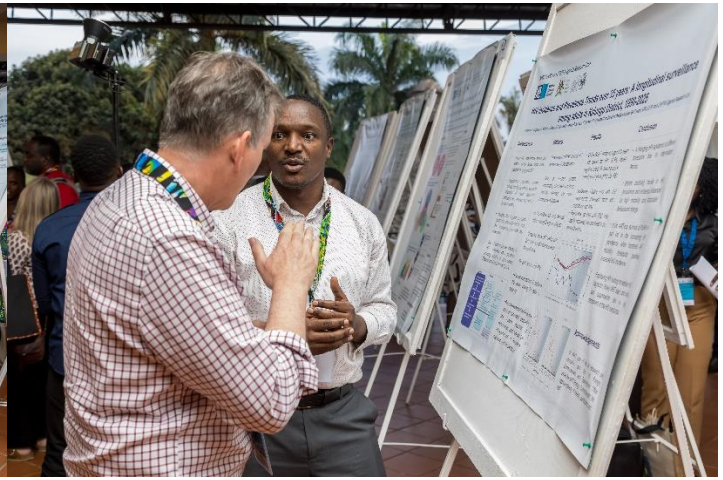
Strong emphasis was placed on disability-inclusive research, ensuring the active involvement of people with disabilities in study design and implementation. Researchers were urged to:

- Strengthen disability-inclusive policies and secure funding for accessibility improvements.
- Train researchers and policymakers on disability inclusion.
- Expand mental health support for individuals with disabilities through integrated care models.

Key Action Points

- The TB controlled human challenge study and the post-mortem biomarker study will engage with the Ministry of Health's Data and Surveillance sub-committee.
- Researchers will explore collaborative approaches to vaccine testing, outbreak preparedness, and genomic-based precision medicine.
- Efforts to integrate NCD management into routine healthcare will be intensified.

The conference also featured a dynamic poster competition, showcasing research across various fields, as well as the five research platforms of the MRC Uganda Unit, namely the General Population Cohort, Clinical Trials, Immunology, Clinical Diagnostics and Laboratory Services and Biobanking, and Sequencing. 42 posters were displayed across two days.

The competition concluded with an award session recognizing outstanding contributions, where four winners were announced:

Third Prize: Health System Strengthening Interventions to Improve Access to Healthcare for Persons with Disabilities in Uganda – (Score: 54/60)

Second Prize (Tie): Prediction Model for Type 2 Diabetes Mellitus Among Young Adults in Uganda (Score: 56/60) and Surveillance Study (Score: 56/60)

First Prize: Predicting HIV-1 Mutation Frequencies Using Time Series Models – Stella

ANNEXES

ANNEX ONE: CONFERENCE RESOURCES

Access via website link

ANNEX TWO: CONFERENCE PROGRAMME AND KEY PRESENTER PROFILES

Access via: download link