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genomics, epidemics
& microbes

the gem

HealthTech Connect

What does it take to move an idea from the lab into the real world?

VEME 2026

The 29th Virus Evolution and Molecular Epidemiology workshop in Stellenbosch



summary

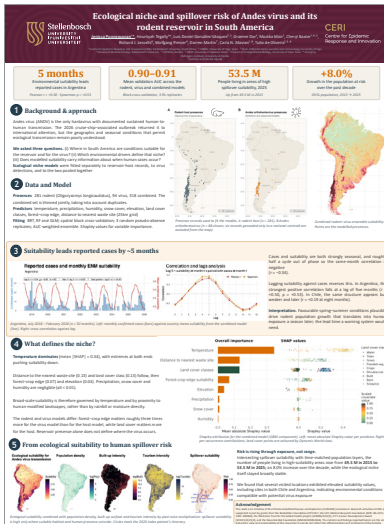
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VEME: Reading The Signals

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Ecology and Epidemiology

At the 9th World One Health Congress in Lisbon, Portugal, Jenicca Poongavanan joined experts from around the world working across human, animal, and environmental health. For Jenicca, the Congress offered an opportunity to explore how bringing ecological and epidemiological thinking together can help us better understand disease risk.

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Who is Vergent Biotech?

A South African genomics company and Stellenbosch University spin-off powered by the Centre for Epidemic Response and Innovation (CERI), Vergent provides a dedicated commercial interface connecting researchers, clinicians, and industry with CERI's advanced genomics infrastructure, sequencing, bioinformatics capabilities, and expertise.

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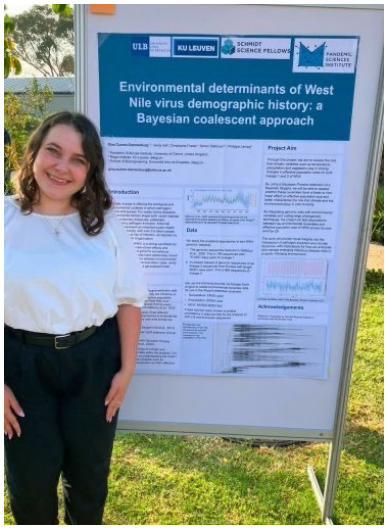
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Cape HealthTech Connect

Africa is producing promising new health technologies, but developing the innovation is only part of the journey. At Cape HealthTech Connect 2026, researchers, entrepreneurs, clinicians, and investors explored what it takes to move an idea from the lab into the real world.

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VEME: The Science

From tracing HIV evolution to understanding mpox transmission and the influence of climate on West Nile virus, researchers at VEME 2026 explored what genomic data can reveal about how viruses evolve and spread – and why interpreting those signals requires care.

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International Virology Honour

Professor Tulio de Oliveira, Director of the Centre for Epidemic Response and Innovation (CERI) at Stellenbosch University (SU), has been awarded the prestigious Gardner Lectureship Award by the European Society for Clinical Virology (ESCV), recognising his international contributions to virology, genomic surveillance and epidemic response.


Praelexis

editorial

This month, Stellenbosch brought together two very different communities with a shared purpose: turning knowledge and innovation into impact.

At VEME 2026, scientists from across the world gathered in Stellenbosch to explore how we can better understand virus evolution and transmission, and use increasingly diverse sources of data to detect emerging threats earlier. Genomics remains fundamental, but we are increasingly integrating it with epidemiology, ecology, climate, mobility, mathematical modelling, and new approaches in artificial intelligence to build a more complete picture of epidemic risk.

This is particularly important for Africa. We face substantial infectious disease risks, but we have also built remarkable scientific expertise and genomic surveillance capacity over the past decade. As Prof Houriiyah Tegally highlighted at VEME, this places Africa at an important intersection of risk, innovation, and capacity building – with an opportunity to lead in epidemic preparedness rather than simply respond to threats after they emerge.

Just days later, Cape HealthTech Connect asked a different but closely related question: once we have the science and innovation, how do we ensure they reach the people who need them? Researchers, clinicians, entrepreneurs, investors, and industry came together to examine the difficult journey from a promising idea to a technology that can be implemented at scale.

The innovations showcased demonstrated that Africa is not short of ideas. Moving from discovery to impact requires investment, partnerships, regulatory pathways, commercial expertise, and technologies designed around the realities of the communities and health systems they are intended to serve.

For me, VEME and Cape HealthTech Connect capture an important moment for African science. We have growing scientific expertise, infrastructure, data, and innovation. Our challenge is to connect these strengths – across disciplines, institutions, sectors, and countries – and translate them into earlier detection, better technologies, stronger health systems, and ultimately better health.

Africa should not only contribute to the science and technologies shaping the future of global health. We should be building that future here.

text: **Tulio de Oliveira**
photo: **CERI Media, Charlie Sperring**

What Turns Ebola Spillover into an Outbreak?

Why does one encounter with an Ebola virus end with a handful of cases, while another becomes a major outbreak? A new publication argues that answering this requires looking beyond the pathogen to the ecological, social, and structural conditions that shape what happens after spillover.

text: **Katrine Anker-Nilssen** photos: **Supplied**

When an Ebola outbreak begins, attention understandably turns to the virus: where it came from, how it is spreading, and how transmission can be stopped. But the virus alone cannot explain why some spillover events are contained while others develop into large outbreaks.

A new publication in *The Lancet Microbe* argues for a broader approach to recurrent Ebola outbreaks – one that considers not only the pathogen and its evolution, but the ecological changes that create opportunities for spillover and the social and structural conditions that determine what happens next.

BELOW: *Prof Jean Nachega (second, from left) with frontline Ebola response colleagues at the Rwampara Treatment Center, Bunia, Ituri Province, Democratic Republic of the Congo, during the Africa CDC mission, 12–15 June 2026.*



"The virus is the proximate cause of the disease, but it doesn't explain the outbreak," says Prof Carla Mavian. "Bundibugyo virus did not create conflict, displace communities, weaken health systems or erode trust, and yet those are the things that determine whether a spillover becomes over 8,000 cases."

The distinction matters because the factors that make spillover possible are not necessarily the same ones that determine whether it escalates.

Deforestation, mining expansion, agricultural encroachment, wildlife exploitation, climate variability, migration, and trade can all change interactions between people, animals, and viruses, increasing opportunities for an initial encounter.

What follows depends on a different, although often overlapping, set of conditions.

"Ecological disruption sets up the encounter," Prof Mavian explains. "Structural vulnerability decides what happens next."

Conflict, displacement, food insecurity, population mobility, weak health systems, limited access to care, scarce diagnostic capacity, and mistrust can determine whether a spillover is detected early and contained or goes unnoticed and amplifies.

This perspective also changes how human behaviour is understood. Hunting, butchering, forest entry, caregiving, and funeral practices can all be epidemiologically relevant, but Prof Mavian cautions against considering them separately from the circumstances in which people live.

"For communities living near forests, forest use is livelihood, food, medicine and survival," she says. "Narratives that focus narrowly on bushmeat become stigmatising when they are detached from the poverty, insecurity, displacement and absence of alternatives that shape those decisions."

Trust is similarly complex. During the 2018–2020 outbreak in eastern Democratic Republic of the Congo (DRC), Prof Mavian says mistrust reflected factors including political exclusion, violence, previous experiences with state and international actors, and perceptions that Ebola attracted substantial international resources while other health needs remained neglected.

"Trust cannot be manufactured during an emergency," she says. "It comes from sustained investment in reliable services and accountable institutions."

For the authors, understanding these different layers of risk has practical implications for Ebola preparedness.

Rapid diagnostics, infection prevention and control, clinical care, therapeutics, vaccination where available, contact tracing, and safe and dignified burial remain fundamental to outbreak response. But the publication argues that preparedness must also begin further upstream.

This means bringing together human, animal, and environmental surveillance with genomic and metagenomic monitoring, while also considering land-use change, mobility, conflict, climate, and other factors that influence both spillover and outbreak amplification.

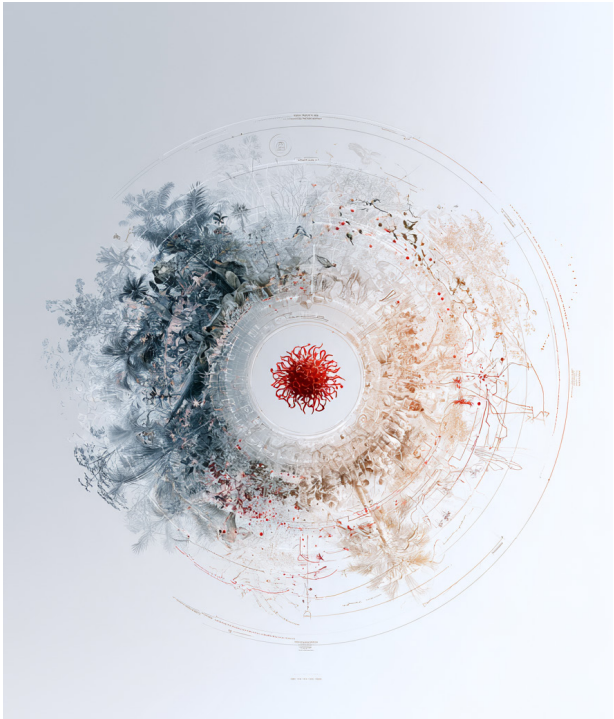
Prof Jean Nachega, first author of the publication and Director of Stellenbosch University's Biomedical Research Institute (BMRI), was part of an Africa CDC response mission to the DRC in June 2026.

"The future of Ebola preparedness lies in connecting genomics with ecology, epidemiology and social context," says Prof Nachega. "Genomic surveillance can help us understand how viruses emerge and spread, but preventing outbreaks also requires understanding where environmental change, human vulnerability and fragile health systems intersect."

Combining genomic surveillance and phylogenetics with environmental and wildlife monitoring, land-use analysis, mobility data, conflict mapping, and mathematical modelling could help identify where the risk of spillover and the risk of subsequent amplification coincide – rather than treating them as the same problem.

This broader view also expands what counts as outbreak prevention.

"Food security should be viewed as epidemic prevention. Peace and protection should be recognised as health infrastructure," says Prof Mavian. "Ebola preparedness



cannot be the responsibility of ministries of health alone."

Community engagement, the authors argue, should similarly extend beyond messaging during an emergency. Instead, communities should be involved as partners through trusted local messengers, local employment, transparent data sharing, and care and burial practices developed with the people they are intended to serve.

The same principle applies to the science generated during outbreaks. Prof Mavian says outbreak science should be "ethical, equitable, and locally accountable", avoiding arrangements in which samples, data, authorship, intellectual property, and institutional recognition flow away from the countries carrying the greatest burden.

Ultimately, the publication argues for complementing the ability to respond rapidly to Ebola with investment in the conditions that can reduce the likelihood of outbreaks escalating in the first place.

"If Ebola is understood as a pathogen-centred emergency, investment stays episodic and reactive," says Prof Mavian. "If it is understood as an ecological, clinical and social event, investment also has to reach environmental stewardship, food systems, conflict reduction, primary care, laboratories, education and community trust."

Read the full publication here: https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(26)00144-8/fulltext

Reading the Signals before Outbreaks Spread

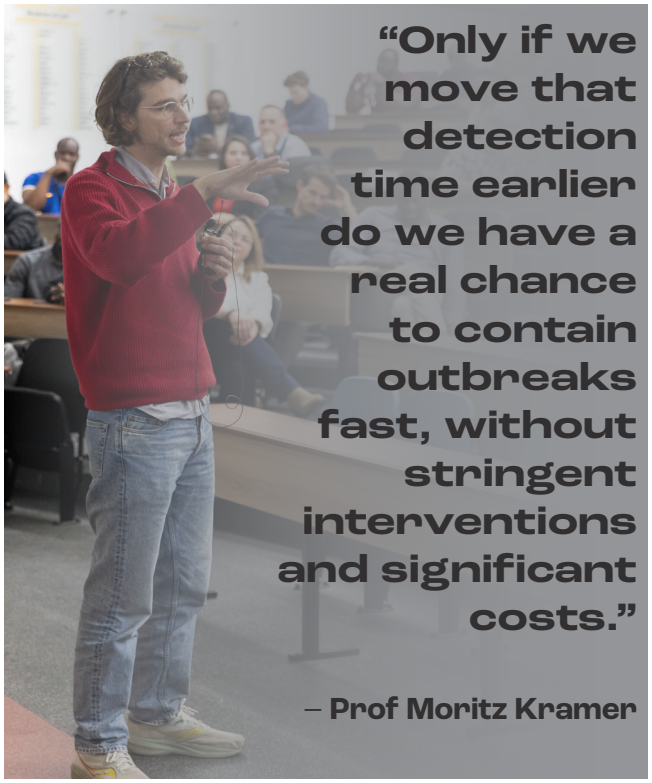
At VEME 2026 in Stellenbosch, Professors Moritz Kraemer and Houriiyah Tegally explored a central challenge for future outbreak preparedness: how to connect increasingly diverse sources of data to detect emerging threats earlier, understand how they develop, and target surveillance more effectively.

text: **Katrine Anker-Nilssen** photo: **CERI Media, Charlie Sperring**

When an outbreak first emerges, scientists often have only fragments of information. The pathogen itself may not yet be identified, its growth rate may be unknown, and researchers may have little idea of where it has already spread.

The keynote Open Lecture, held at Reitz Hall at Stellenbosch University on Wednesday, 9 September, formed part of the 29th International Virus Evolution and Molecular Epidemiology (VEME) Workshop.

For Professor Moritz Kraemer, Professor of Epidemiology and Data Science at the University of Oxford, one of the central challenges is reducing the time between a pathogen becoming established in a human population and its detection.



“Only if we move that detection time earlier do we have a real chance to actually contain outbreaks fast and not have to put very stringent interventions and a lot of money on the line to do that,” he said.

The question, then, is how surveillance systems can be designed to find emerging threats faster.
Prof Kraemer described work on adaptive surveillance, where information accumulating during an outbreak can help determine where limited testing resources should be deployed next. Rather than relying only on passive systems to detect outbreaks, the aim is to identify an optimal strategy for building a picture of an outbreak as quickly as possible, using as few tests as possible.

Some of the methods being investigated come from AI research. Active learning approaches developed for applications such as social media algorithms can, Prof Kraemer explained, be reconsidered in a very different context: instead of determining what a person should see in a feed, they could help researchers decide what they should be looking for, and where.

His team has explored how such approaches could incorporate patterns of human mobility and different layers of surveillance within a country to shorten the time needed to detect a new variant, lineage, or pathogen.

For Associate Professor in Bioinformatics Houriiyah Tegally, Head of Data Science at Stellenbosch University’s Centre for Epidemic Response and Innovation, the challenge extends across the full trajectory of an outbreak – from the conditions that enable a pathogen to emerge to those that allow it to establish and spread.

Prof Tegally explained that her team is trying to address an important knowledge gap: how to connect the different pathways that allow pathogens to emerge and develop into outbreaks in urban settings, or even global pandemics.

While factors such as climate, viral genetics, ecology, and transmission can be studied individually, the challenge is to better understand how they interact.
Work on Ebola spillover in the eastern Democratic Republic of the Congo illustrates this approach. Existing ecological models had classified the area where an outbreak occurred as being at moderate risk. Prof Tegally and colleagues therefore investigated why spillover had occurred in that particular place.

Updating the ecological niche model increased the estimated suitability of the area, but the researchers went further, combining ecological information with data on human settlement, forest loss, bushmeat activity, proximity to mining, and conflict. Incorporating these factors improved the ability of the models to identify potential spillover locations.

The same principle – bringing different forms of information together – runs through work on other emerging pathogens. Prof Tegally described studies combining ecological suitability with population and human movement data, as well as research linking pathogen dispersal with environmental conditions to better understand how outbreaks expand.

AI offers additional tools for exploring these relationships. Prof Tegally presented work using deep learning to model dengue distribution across different spatial scales, as well as research using satellite imagery to estimate displacement following climate disasters. In the latter study, adding satellite features improved the models, particularly when estimating large-scale displacement. But the potential of AI also comes with important limitations.

“The risk with AI is that we cannot explain what the model tells us,” Prof Tegally said. “One major emphasis when we are using AI in this kind of work is to be able to explain the models and defend the models.”

That becomes particularly important when a model identifies a particular place as being at high risk. Researchers need to understand why a model reaches its conclusions, particularly when those results could influence surveillance or other decisions.

Greater use of AI also does not mean abandoning established approaches. Prof Tegally noted that much of her team’s work continues to use traditional mathematical and statistical models, with the choice of method depending on the question, the structure of the data, and how far researchers need to be able to explain the result.

Prof Kraemer similarly pointed to areas where considerable work remains before AI can deliver more transformative advances in infectious disease research.

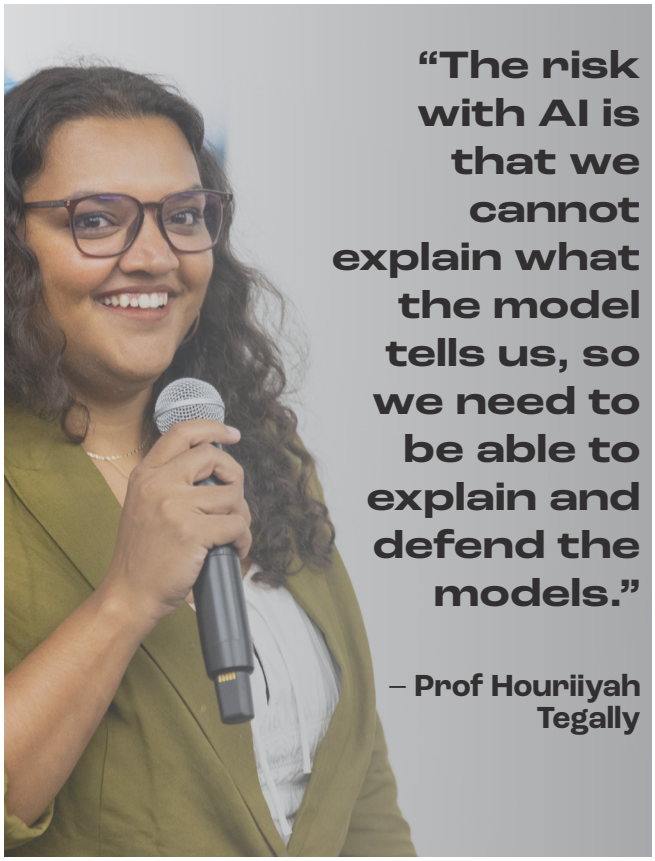
One challenge is moving beyond individual indicators of emergence towards understanding the full pathway through which a pathogen can move from animal populations to becoming a risk at population level.

Together, the two perspectives point towards a more connected approach to outbreak science: one that not only gathers more information, but brings different sources of data together to identify where threats may emerge, understand how they are spreading, and determine where surveillance should focus next.

For Prof Tegally, Africa is particularly well placed to help drive that work.

“I think that in Africa, we are at a perfect intersection of, sadly, risk, but also of innovation and capacity building to position the continent as a leader in preparedness and in understanding these various different dynamics,” she said.

The aim, she explained, is ultimately to “close the loop” – linking genomic surveillance and transmission dynamics with risk mapping, and feeding that knowledge back into better surveillance.



Asking More of Health Data

For Tammara Koh and Thenuja Pillay, a recent summit on observational data offered new ways of thinking about what health data can tell us when clinical trials are not possible.

Clinical trials are often considered the gold standard for determining whether a treatment or intervention causes a particular health outcome. But what happens when conducting a randomised trial is not feasible?

For Tammara Poa Siang Koh and Thenuja Pillay, the Learning from Observational Data Summit offered an opportunity to explore how researchers can approach these questions using data that already exist.

The summit, hosted by Katalitix and led by Professor Ruth Keogh from the London School of Hygiene and Tropical Medicine and Wim Delva, combined conceptual teaching with hands-on workshops, coding walkthroughs, and discussions around real-world health-data challenges.

A central focus was target trial emulation – an approach that starts by defining the randomised trial researchers would ideally conduct and then uses observational data to emulate that trial as closely as possible.



For Tammara, a PhD candidate at the South African Centre for Epidemiological Modelling and Analysis (SACEMA) and the Centre for Epidemic Response and Innovation (CERI), the framework provided a particularly useful way of thinking about causal questions.

“The main idea that stayed with me was target trial emulation: starting by specifying the randomised trial one would ideally like to run, and then using observational data to emulate it as closely as possible,” she says. “I found this a very clear way to structure causal questions and make the assumptions behind an analysis more explicit.”

That means thinking carefully about questions such as who would be eligible for a study, what intervention is being investigated, how treatment would be assigned, how long participants would be followed, and what outcome would be measured – before beginning the analysis.

For Tammara, this has direct relevance to her own research. “In my hepatitis B modelling work, much of the evidence comes from observational and serological data, so this framework is useful for distinguishing descriptive inputs and calibration targets from evidence intended to support a causal claim.”

For Thenuja, the summit similarly shifted how she thinks about the possibilities contained within observational data. “It made me see observational data as more than a source of associations or patterns,” she says. “With the right methods and careful assumptions, it can be used to investigate causal relationships and generate credible evidence.”

More broadly, the experience was a reminder that limitations in available data do not necessarily mark the end of a research question.

“When clinical trials are not feasible, it doesn’t necessarily

mean the answer to a causal question ends there," Thenuja says. "There may be a more appropriate or advanced method that allows us to explore these important questions rigorously."

Both participants also highlighted the value of moving between theory and practice during the summit.

Tammara found the applied nature of the training particularly useful. "The combination of conceptual teaching, code-based examples and discussion made causal inference – and trial emulation in particular – feel more concrete and relevant to real-world health-data questions."

For Thenuja, the value extended beyond the technical training to the people and conversations surrounding it. "Beyond the technical learning, I valued being surrounded by people who are passionate about using data to address real-world health challenges," she says, "and being exposed to enlightening discussions aimed at informing better solutions and decisions in healthcare."

Together, their reflections point to a broader lesson from the summit: learning from observational data is not simply about having more data, but about asking clearer questions, understanding the assumptions behind an analysis, and choosing methods that allow existing data to provide meaningful evidence.

Celebrating Research

VEME 2026 poster winners takes the spotlight.

Six participants were recognised for their research presentations at the 29th International Virus Evolution and Molecular Epidemiology (VEME) Workshop in Stellenbosch, across the Evolutionary Hypothesis Testings (HT) and Phylogenetic Inference (PI) modules.

Evolutionary Hypothesis Testing

Isobel Guthrie, a DPhil student at the University of Oxford, took first place for research into insertions and deletions, or indels, in SARS-CoV-2. Her work found evidence that recurrent deletions in the NSP1 protein may be selected for within an individual infection, but selected against at the wider between-host scale.

Second place went to *Etienne Frumence*, from CHU de La Réunion, who used more than 3 100 viral genomes to reconstruct how the 2024–2025 chikungunya epidemic spread across Réunion Island. The study showed how genomic surveillance can reveal transmission patterns and the influence of factors such as climate and population immunity.

Dr Delia Doreen Djuicy, from Centre Pasteur du Cameroun, received third place for research into how the Sanaga River influences the evolution and movement of Mpox. Her work found that the river can act as both an ecological boundary and a corridor shaping viral diversification and spread.

Phylogenetic Inference

First place went to *Lilli Marie Gralla*, from the Helmholtz Institute for One Health in Germany, whose team used penguin mummy samples from Antarctica to investigate whether ancient pathogen sequences can be recovered from environmental samples. Their findings demonstrate the potential to retrieve ancient RNA viral sequences and explore pathogen evolution over time.

Second-place winner *Phionah Tushabe*, from the Uganda Virus Research Institute, used wastewater sequencing to investigate the circulation of EV-A71 and EV-D68 in Uganda. Both viruses were detected, including strains carrying mutations associated with neurotropism.

Third place went to *Martin Maidadi-Foudi*, from CREMER in Cameroon, whose research reconstructed SARS-CoV-2 transmission involving Cameroon between 2021 and 2022. The analysis revealed substantial viral diversity and bidirectional transmission, highlighting the importance of sustained local genomic surveillance.

Together, the winning posters spanned viral evolution within individual infections, transmission across populations and landscapes, and viruses preserved from the distant past.



When Ecology and Epidemiology Meet

At the 9th World One Health Congress in Lisbon, Jenicca Poongavanan explored how bringing ecological and epidemiological thinking together can help us better understand disease risk.

text: **Jenicca Poongavanan** photos: **Supplied**

The World One Health Congress brings together experts from around the world to advance collaboration at the intersection of human, animal, and environmental health. The ninth edition ran from 4–7 September 2026 in Lisbon, Portugal.

What struck me about this year's framing was how much of it was about the connective tissue rather than the disciplines themselves. Less "here is what veterinarians do, here is what epidemiologists do", and more "why are these conversations still happening in separate rooms?"

CERI had a small but busy presence. Prof Carla Mavian and Dr Monika Moir were both there, and the three of us ran the species distribution modelling workshop together. Both are also co-authors on the Andes virus work I presented, so it was a rare chance to have a whole project in one room at one time, rather than spread across a thread of emails and time zones.



That emphasis on crossing disciplinary boundaries resonated with all three of us. For Monika, the Congress demonstrated the value of bringing very different perspectives together.

"It is a space where science, policy and practice intersect around the shared challenges of emerging infectious diseases, antimicrobial resistance, environmental change and global health," she says. "The breadth of expertise, backgrounds and perspectives represented at the Congress was outstanding and created an ideal platform for multilateral engagement and genuinely transdisciplinary research collaborations."

Carla was struck by a similar message in one of the first keynotes. "Instead of destroying silos, let's build bridges across them," she says. "We each have our own expertise – our 'silo' – and the important thing is building bridges that allow us to collaborate across them."

Where Andes virus could spill over

My poster covered work on Andes virus and its rodent reservoir across South America. Andes virus is the only hantavirus with documented sustained human-to-human transmission, and the cruise ship outbreak earlier this year put it back on the international radar, but the conditions that permit ecological transmission are still poorly understood.

We modelled the rodent host and the virus separately, then together. Temperature turned out to dominate, and not in a simple "more is better" way: extremes at both ends pushed suitability down. Proximity to waste sites and land cover followed, while rainfall and humidity had less of an impact. More usefully, the host model and the virus model

disagree. Reservoir presence alone does not tell you where the virus is, which matters for anyone designing surveillance around the rodent. And when we laid suitability over where people live, build, and travel, the population inside suitable areas had climbed over the past decade while the ecological niche itself stayed put. People are moving into the risk rather than the risk moving towards them.

The result that generated the most conversation, though, was a timing one. In Argentina, suitability and reported cases are both seasonal and sit roughly half a cycle out of phase, so comparing them month against month makes the relationship look negative, and you would write the signal off. Shift suitability forward and it reverses, with the strongest alignment landing around five months ahead of cases. Chile shows the same shape.

SDM workshop

The workshop was a hands-on introduction to species distribution modelling for diseases and their vectors, run with Carla and Monika. The premise was to get people from a blank R session to a finished, interpretable map in one sitting, with no prior experience assumed, using open occurrence records and freely available climate layers for Aedes aegypti in Brazil.

What I wanted people to leave with had little to do with the mosquito. The boring decisions are the ones that matter: where you place your background points changes the map more than any model setting you will ever tune, and we compared three strategies side by side and watched the answer move. We wanted participants to leave with the important concepts around SDMs and enough tools to be able to experiment on their own later on.

What I took home

The part I valued most was a workshop where we discussed the needs and ways around bridging the gap between ecology and epidemiology. Most of the room does not build species distribution models, so the questions came from the other side of that boundary: where an ecological model fits into an epidemiological question, and what would need to be true before anyone acted on one. That conversation sits at the centre of One Health work, and it is the one I want to keep having.

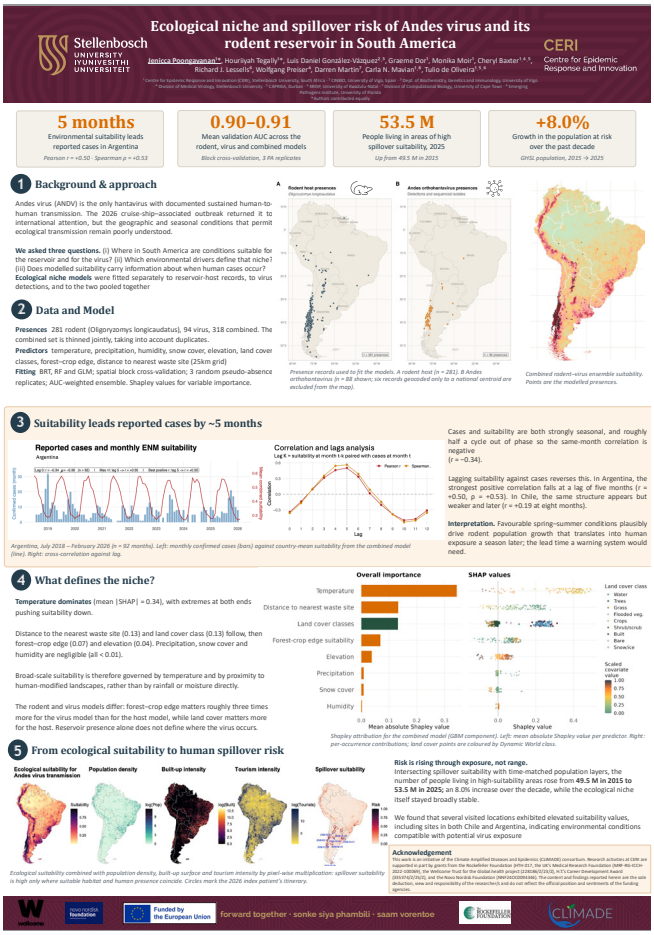
My background in statistical ecology has shaped my interest in where disease vectors occur, how their distribution influences the risk of human infection, and how early we can anticipate outbreaks. These questions sit at the intersection of ecology and public health, where methods for integrating knowledge across disciplines are still evolving.

I would like to develop modelling approaches that bring ecological processes and human health outcomes together from the outset, and my Andes virus lag analysis is an early step in that direction.

For me, the value of meetings like the World One Health Congress lies in the opportunity to discuss this work with people who approach these questions from different perspectives. A question during a presentation or a conversation at a poster can reveal an overlooked assumption, suggest a new approach, or lead to a collaboration that strengthens the work.

“Instead of destroying silos, let’s build bridges across them. We each have our own expertise – our ‘silo’ – and the important thing is building bridges that allow us to collaborate across them.”

– Prof Carla Mavian



Bringing Multi-Omics into the Research Picture

By bringing together different layers of biological data, multi-omics is opening new possibilities for tackling complex biological questions. This potential was the focus of the Cape Town Multi-Omics Roadshow.

text: Katrine Anker-Nilssen
photos: Jahk van Heerden & CERI Media, Charlie Sperring

Multi-omics combines information from different layers of biology – such as genomics (DNA), transcriptomics (RNA), proteomics (proteins), and epigenomics (changes that influence how genes function) – to provide a more complete picture of biological systems than any one approach can offer alone.

The Multi-Omics Roadshow brought together researchers, genomics facilities, sequencing service providers, and technology specialists to explore the next generation of biological research. "The idea behind the Multi-Omics Roadshow was to introduce South Africa to the exciting new opportunities that multi-omics is creating," said organiser Maritza Hanekom, Product Manager: Sequencing & Microarray at Separations.

"Our goal was not simply to showcase new technology, but to bring together researchers, genomic facilities and sequencing service providers to have meaningful conversations about how genomics, transcriptomics, proteomics and other multi-omics approaches can work together to answer more complex biological questions."

At the Cape Town event on 27 August, Dr Lavanya Singh, Head of Laboratory and Quality Management at the Centre for Epidemic Response and Innovation (CERI), represented Vergent Biotech, powered by CERI, presenting a host-site case study based on CERI's experience in high-throughput genomics.

Dr Singh highlighted the scientific and technical capacity underpinning Vergent, including CERI's accredited laboratory, bioinformatics expertise, automation, and sequencing infrastructure.

"For a multi-omics audience evaluating service providers, accreditation and platform breadth are the two things that signal real capacity rather than aspiration," Dr Singh said. "It shows we can match the assay to the question, at scale, with a quality system behind every result."

Hanekom said Vergent was invited to share its Cape Town experience because of its work applying next-generation sequencing (NGS) across fields ranging from infectious disease and epidemiological research to human whole-genome sequencing, methylation, and transcriptomics.

"We wanted them to share their Cape Town story because it demonstrated how multi-omics and NGS can move from technology into real-world research and service delivery in Africa," she said.

For Dr Singh, the response from participants showed particular interest in flexible access to advanced sequencing capacity. "One thing that came through clearly was how well the flexibility of our genomics service model landed," she said.

Researchers can engage at different points in the sequencing pipeline depending on the capacity they already have – an approach that Dr Singh said resonated with attendees who may have some infrastructure or expertise, but not the complete pipeline.

"It meant they didn't have to choose between doing everything themselves or handing it all over," she said.

Participants also showed interest in the rigour behind CERI's validated methodologies, including its human

whole-genome sequencing assay benchmarked against Genome in a Bottle reference samples.

But the discussions went beyond sequencing alone. Hanekom said some researchers are already combining different omics approaches, while the roadshow encouraged others to consider how integrating multiple types of biological data could change the questions they are able to ask.

“What stood out to me was how eager and ready South Africa is to expand into multi-omics,” she said.

That shift is also reflected in the areas CERI and Vergent are exploring, with Dr Singh pointing to proteomics, transcriptomics, and DNA methylation studies alongside genomics.

“We’re extending beyond traditional genomics scope to expand into proteomics, transcriptomics, and DNA methylation studies, alongside rare disease diagnostics and precision medicine – integrated multi-omics rather than single-layer sequencing,” she said.

For Hanekom, the next opportunity lies in turning the conversations sparked by the roadshow into collaboration.

“The Roadshow opened the door to conversations around what researchers want to achieve, and our role is to connect them with the right technology, expertise and service partners to make those research goals possible,” she said.

“South Africa has the scientific expertise and the appetite. We now have an opportunity to bring the technology, skills and service capability together to take multi-omics to the next level.”

For more info about Vergent Biotech: Visit https://vergentbiotech.com









Postdoctoral Research Fellowship:

One Health Genomic and Environmental Modelling of Infectious Diseases in Africa

APPLICATION DEADLINE EXTENDED: 9 October 2026, 22:00

Vergent Biotech: Expanding Access to Advanced Genomics in Africa

Powered by the Centre for Epidemic Response and Innovation (CERI) at Stellenbosch University, Vergent Biotech is connecting researchers, clinicians, and industry with advanced genomics sequencing and bioinformatics capabilities.



Africa holds greater human genetic diversity than any other continent, yet African populations remain significantly underrepresented in genomic research. Closing that gap requires not only scientific expertise, but access to the technologies and infrastructure needed to generate and analyse genomic data.

Vergent Biotech, a South African genomics company and spin-off company from Stellenbosch University, has been established to provide a dedicated, commercial interface between the customer and the advanced genomics infrastructure and expertise developed at CERI. Simply put, Vergent deals with the genomics consulting and commercial aspects of the service request, which will be delivered through CERI. Together, Vergent, powered by CERI, aims to provide access to one of Africa's most advanced and automated sequencing facilities on the continent, thereby supporting a broad range of research, clinical, and public health applications.

Professor Tulio de Oliveira, Director of CERI, is the founder of Vergent and Chair of its Scientific Advisory Committee.

Through Vergent, partners can access integrated genomics workflows spanning sample processing, next-generation sequencing, bioinformatics, and data analysis. Its services include whole genome and whole exome sequencing, RNA sequencing, metagenomics, pathogen genomics, and custom genomics solutions.

The infrastructure behind these services includes advanced Illumina sequencing platforms, including the NovaSeq XPlus, NovaSeq 6000, NextSeq 2000, and MiSeq i100, together with highly automated robotic systems for sample processing to enable the production of high-throughput and consistent results, all backed by advanced laboratory information management systems (LIMS).

"Africa needs greater access to advanced genomics infrastructure if we are to translate our scientific capacity into real-world impact. Vergent was created to open up CERI's technology and expertise to researchers, clinicians, and industry, and help build a stronger genomics ecosystem on the continent," says Prof de Oliveira.

Vergent's potential applications extend across human and pathogen genomics. In clinical and research settings, whole genome and exome sequencing can support work in rare diseases, cancer, population genomics, and precision medicine. Pathogen genomics can contribute to outbreak investigation, epidemiological tracking, and antimicrobial resistance monitoring, while metagenomics and RNA sequencing open further possibilities across infectious disease, microbiome research, biomarker discovery, and functional genomics.

For biotech and pharmaceutical partners, Vergent aims to provide scalable omics data for biotechnology development and clinical trials, alongside custom sequencing workflows and assay development for specific research or industry needs.

Vergent's approach begins with understanding what each client is trying to achieve and developing a workflow suited to their specific needs.

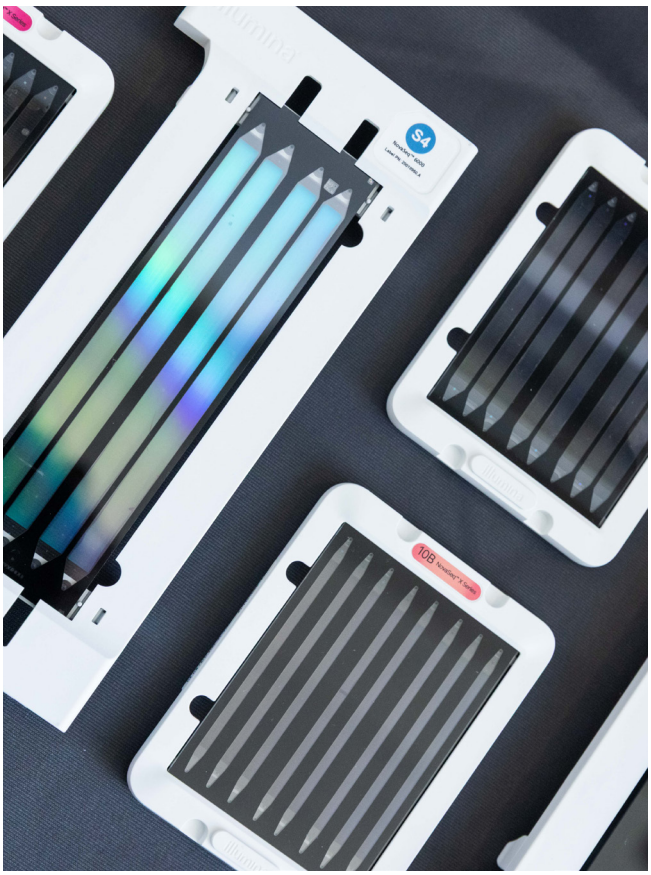
"Every client comes to us with a different problem to solve, and at most times very interesting research. These range from groups needing whole genome sequencing at scale, a biotech company validating a new assay, or a pharmaceutical partner looking for reliable omics data to support a trial. Our greatest asset is for us to listen, and truly understand exactly what they are trying to achieve, and translate that into a workflow that draws on CERI's infrastructure and expertise. We want working with Vergent to be straightforward with clear scopes, dependable turnaround times, and a team that understands both the science and the commercial realities our partners are working under," says Dr Ali Kiyaei, Commercial Officer at Vergent Biotech.

"What Vergent offers in practice is direct access to a genomics space that already operates to the highest quality standards – including ISO/IEC 17025 accreditation, so partners can trust the data generated. I'd like to see Vergent grow partnerships that build genomic capacity here on the continent – projects with African researchers, public health institutions, and biotech companies who need dependable, high-quality data to move their projects forward, without having to build that infrastructure themselves. The flexibility of our genomics model also enables researchers to choose between a complete end-to-end genomics workflow from sample processing to bioinformatics analysis, or a more budget-friendly approach making use of the laboratory's QC and instrument services," says Dr Lavanya Singh, Vergent Director and Head of CERI Laboratory.

The company is also developing further capabilities, including single-cell sequencing and spatial transcriptomics, while CERI is pursuing ISO 15189 accreditation to support full clinical genomics testing.

By bringing together sequencing technology, laboratory automation, scientific expertise, and bioinformatics, Vergent is helping to ensure that advanced genomics conducted in Africa can draw on African infrastructure, expertise, and genetic data – supporting genomic research from sample to insight and translating those insights into applications in health, science, and biotechnology.

Find out more about Vergent Biotech here: https://vergentbiotech.com/ or get in touch with Commercial Genomics Consultant Ali Kiyaei on ali@vergentbiotech.com



Growing The Pie

Fluorobiotech was recently recognised with the Ecosystem Champion Award at the 2026 US Enterprises CEO Awards, celebrating our commitment to collaboration, opening opportunities for others, and contributing to the growth of South Africa's biotechnology ecosystem.

text MJ van Vuuren **photos:** Curt Ruiters & CERI Media, Charlie Sperring

Based in Stellenbosch, Fluorobiotech develops and manufactures complex biological raw materials used in the production of biopharmaceuticals and diagnostics, including vaccines, PCR-based tests, and rapid tests. While building our own manufacturing capabilities and product portfolio, we have consistently taken the view that long-term success in biotechnology depends on strengthening the broader ecosystem around us.

For Fluorobiotech, this philosophy can be expressed simply: don't just grow your slice of the pie, grow the pie. Building a sustainable biotechnology industry requires the development of multiple, interconnected links across the value chain, from research and technology development to reagent production, testing, manufacturing, and ultimately commercialisation. Strengthening these capabilities locally can help reduce South Africa's dependence on imported biotechnology products and raw materials, while creating local demand that supports the emergence and growth of other biotechnology businesses.

As our COO and co-founder, Dr Ross Vermeulen, explains: "A biotechnology company cannot succeed in isolation. Our ambition has never been simply to grow Fluorobiotech, but to help build an ecosystem in which South African science, talent and innovation can translate into products manufactured here and taken to the world. When we build local capability, share expertise and create opportunities for others, we strengthen the entire value chain."

One example of this philosophy in practice is our contribution to establishing the LaunchLab CERI BIO laboratory facility in Stellenbosch. Fluorobiotech spearheaded the renovation, design, and implementation of the facility, which provides biotechnology start-ups with access to affordable, fit-for-purpose laboratory infrastructure where they can develop, validate, and begin commercialising their technologies. We have subsequently continued to support its operation.

CERI and the broader Stellenbosch University innovation ecosystem have also played an important enabling role in Fluorobiotech's journey, providing an environment in which scientific development, commercialisation, and manufacturing capability can grow together. LaunchLab CERI BIO demonstrates how universities, research institutions, and biotechnology companies can work together to help translate scientific expertise into locally developed products, manufacturing capability, skilled jobs, and commercial activity.

Our approach also extends into our own product





development and technical collaborations. Through the local manufacture of recombinant antigens for infectious-disease research and diagnostic development, as well as enzymes used in mRNA production, we are building capability in areas where South African and African researchers, diagnostic developers, and manufacturers have traditionally relied heavily on imported biological reagents.

To date, Fluorobiotech has launched six products, with more scheduled for launch later this year. We currently employ three junior production scientists, one senior production scientist, and a junior quality officer, and have established several local and international partnerships.

Growing this value chain also has a human impact. A stronger domestic biotechnology industry creates opportunities for South Africa to retain and employ more of the talented scientists, engineers, and technical graduates emerging from its universities. Converting local scientific expertise into locally manufactured products and commercially sustainable businesses has the potential to create high-skilled employment while strengthening South Africa's capacity to respond to its own healthcare and biotechnology needs.

For CEO and co-founder Dr Du Preez van Staden, the Ecosystem Champion Award reflects this broader approach. "When we started Fluorobiotech, we set out to prove that world-class biotechnology could be developed and manufactured here in South Africa. Along the way, we realised that building a successful company also means helping to build the environment in which companies like ours can succeed.

"This recognition is particularly meaningful because it reflects something we have believed from the beginning: our success should create opportunities for others, strengthen local capability and contribute to an ecosystem that can compete globally. If South African biotechnology is going to realise its full potential, we have to build it together."

Looking ahead, our focus is on expanding our locally manufactured portfolio of recombinant proteins and enzymes, including products supporting infectious-disease diagnostics and emerging mRNA and biopharmaceutical manufacturing. We also intend to extend the reach of our proprietary SelfPrep™ technology through partnerships and licensing, while continuing to collaborate with universities, researchers, manufacturers, and other biotechnology businesses and supporting shared infrastructure such as LaunchLab CERI BIO.

Ultimately, we see Fluorobiotech's growth and the growth of South Africa's biotechnology ecosystem as interconnected. Creating globally competitive products and businesses locally should also create opportunities for scientists, engineers, entrepreneurs, and the companies that follow.

OPPOSITE PAGE: *The 2026 SU Enterprises CEO Award winners, from left: Wiehann Lombard (representing CubeSpace), Amohetsoe Shale (Navu), Dr Kyle Klopper (BioTrac Systems), Dr Tara Southey (TerraClim), and Dr Ross Vermeulen and Dr Du Preez van Staden (FluoroBiotech).*



Beyond the Breakthrough: What Comes Next For African HealthTech?

Africa is producing promising new health technologies, but developing the innovation is only part of the journey. At Cape HealthTech Connect 2026, researchers, entrepreneurs, clinicians, and investors explored what it takes to move an idea from the lab into the real world.

text: **Katrine Anker-Nilssen** photos: **CERI Media, Charlie Sperring**

Africa is not short of health innovation. From artificial intelligence that can help frontline healthcare workers screen for tuberculosis to prosthetic knees designed specifically for African amputees, new technologies are being developed around some of the continent's most pressing healthcare challenges.

But a good idea, even one backed by strong science, does not automatically become a product that reaches patients.

That gap between innovation and impact emerged as a central theme at Cape HealthTech Connect 2026, held at Stellenbosch University's Biomedical Research Institute (BMRI) in Cape Town on Thursday, 17 September.

Opening the event, Professor Elmi Muller, Dean of Stellenbosch University's Faculty of Medicine and Health Sciences, described this as the difficult "last mile" of health innovation.

"If you think of health innovation as a river running through sand towards the sea, many promising ideas simply run dry before they get there," she said. "There is plenty of energy and innovation, but the last mile is often the longest."

Muller pointed to incentive systems that reward clinical care and academic achievement more than innovation, heavy service loads, and a "missing middle" of funding, support, technical expertise, and connections needed to take an idea into practice.

Those challenges shaped the day's programme, which included two panel discussions – Funding the pipeline: Investors, grants & the innovation challenge and AI and data in African healthcare: Built for our context – alongside eight pitches from emerging healthtech ventures.

More than money

Funding is critical to getting health innovations into use, but speakers on the first panel cautioned against treating it as the only missing ingredient.

Dr Richard Gordon, head of the South African Medical Research Council's (SAMRC) Grants, Innovation and Product Development Unit, argued that funding itself is not necessarily as scarce as entrepreneurs assume. "There is a lot of money around, but people are often looking in the wrong places," he said, advising entrepreneurs to diversify their funding sources and look beyond just government.

For university innovations, another challenge is the distance between research and what potential users need. "There is often a gap here," said Ravini Moodley, Director of Stellenbosch University's Innovus Technology Transfer Office. "We need to help researchers shape their questions around what industry and the market can actually use, and encourage those conversations much earlier."

Moodley also highlighted the need for translational funding to support technologies through the multiple steps required to reach market.







For Jonathan Wilson, Partner at Third Way Capital, commercial viability is critical. “If the market is not willing to buy a technology, it won’t ultimately make the impact it needs to make,” he noted.

Rowena Luk, CEO of Africa Health Ventures, agreed that impact and commercial viability need to work together, but broadened the issue beyond investment.

“The question is, with the new generation of technology that is arising with this new era of AI and other biotech-enabled innovations, how do we ensure that the rate of adoption is keeping up with the speed of the technology?”

Policymakers, companies, investors, healthcare institutions, and individuals willing to test new technologies all have a role to play, she said.

From innovation to investment

AI Diagnostics provides one example of how some of those pieces can come together. The South African healthtech company has developed an AI-enabled stethoscope designed to help frontline healthcare workers improve diagnostic and screening accuracy, initially focusing on tuberculosis.

Co-founder, Chairman and CTO Johan Coetzee said the idea grew from the reality that many South Africans encounter a nurse or community healthcare worker before seeing a doctor.

But developing the technology was not the hardest part. Medical-device companies require substantial capital before generating revenue, Coetzee explained, while founders must navigate regulation and commercialisation – particularly challenging for those without a commercial background.

They also need to understand “what actually the client would want”, including being prepared to drop features customers do not value.

AI Diagnostics’ relationship with Africa Health Ventures shows what an investor can contribute beyond capital. Luk recalled that the company approached the fund cold through its website. “We looked at the product, and it was compelling,” she said.

After meeting AI Diagnostics CEO Braden van Breda, she was also impressed by his understanding of the technology, disease area, and potential markets. Africa Health Ventures became AI Diagnostics’ first non-South African investor and helped connect the company internationally, including with the global TB community.

Designed for African realities

Navu Mobility is at a different point in that journey. The company has developed the Navu Knee, a polycentric prosthetic knee designed around the needs of amputees in African settings, with durability, repairability, longevity, accessibility, and affordability built into the product.

“We’re trying to look at those problem cases, which spread across the continent, and say: let’s develop prosthetic components that address those problems specifically,” said Amohetsoe Shale of Navu Mobility.

Navu is now testing and validating the knee ahead of medical-device registration. “With our goal for commercialisation, it’s not just about making money and becoming a company, but rather getting the prosthesis to the people who need it the most,” Shale said.

Since participating in Cape HealthTech Connect last year, Navu has become an official Stellenbosch University spin-out, secured millions of rand in funding, tested the knee with an amputee, incorporated user feedback, and moved through four prototype iterations. It also met one of its current product-development partners at the event.

“I think those conversations with people in the industry also give you a feel of where the industry is going and how to follow that trajectory in order to be moving in the right direction,” noted Shale.

Built for the context

The need to develop technologies around African realities was echoed during the second panel, where Professor Sara Grobbelaar from Stellenbosch University’s Department of Industrial Engineering argued that technologies should be developed with the people and systems that will use them.

“We need to make sure that AI innovation is designed for Africans and for Africa’s realities, rather than simply importing solutions from the Global North,” she said.

Professor Regan Solomons, Executive Head of Stellenbosch University’s Department of Paediatrics and Child Health, said AI could help relieve pressure on overstretched healthcare workers, but stressed the importance of ensuring that tools are appropriate for the populations they are intended to serve.



“The data also needs to be validated in our context,” he said, pointing to Africa’s unique populations, settings, and comorbidities.

For AI Diagnostics, those realities have influenced the technology itself.

“A large proportion of the people we want to reach don’t necessarily have reliable internet or power, so we designed our device not to depend on those things,” Coetzee said. “If you are building for Africa, those realities have to be part of the design.”

Dr Kamlen Pillay, Founder and CEO of InUversal Group, highlighted the potential for AI and data to shift healthcare towards prevention and earlier intervention, while cautioning that technological development can move faster than the ethical and legal frameworks around it.

“We need to build AI in Africa to suit the infrastructure we actually have,” he said.

Connections that move ideas forward

The eight ventures pitching during the day reflected the breadth of the healthtech pipeline, with technologies spanning flow cytometry analysis, antimicrobial testing, single-cell analysis, AI-assisted healthcare, needle-free injection, and neonatal growth measurement.

But Cape HealthTech Connect was not only about showcasing technologies. It also brought together the people needed to help move them forward, with collaboration across research, industry, investment, and government emerging as an important part of translating innovation into impact.

Luk highlighted the value of a dedicated healthtech convening that brings these stakeholders together, and Navu provides a tangible example: a connection made at last year’s event developed into a product-development relationship. For Coetzee, whose company is no longer urgently seeking investment, returning offers a chance to see what new ventures are emerging and explore potential collaborations.

Getting innovation the rest of the way

The technologies showcased at Cape HealthTech Connect are at different stages, with different needs – from validation and regulatory approval to funding, market access, and health-system adoption.

As Muller put it: “We can’t ask industry to meet us halfway if we can’t build the bridge.”

Chisels and Scientific Money

What SU-CERI's Homecoming Reunion said about the future of African science.

text: **Maambele Khosa** photos: **CERI Media, Charlie Sperring**





The Stellenbosch University Annual Homecoming Weekend brought together more than 3 000 alumni from four continents across 53 events. Among them, CERI hosted its inaugural Fellows and African STARS Reunion; a morning of honest conversation about mentorship, collaboration and the commercialisation of African scientific innovation.

Every September, Stellenbosch wakes up. The vineyards turn green, the mountains shake off winter, and Victoria Street fills with people who have not been back in years. This year, thousands of Stellenbosch University alumni from all continents returned for the 11th Annual Homecoming Weekend, travelling from California, New Zealand, London, Kenya and every corner of South Africa for 53 events across three days.

The CERI Fellows and African STARS Reunion was one of them. For CERI, now five years old and with more than 900 trained fellows working across the continent, it was also a first; and a long time coming.

Coming back to a place you never really left

On the morning of Saturday 12 September 2026, more than 50 CERI-trained fellows, African STARS alumni and VEME participants gathered at Postcard Cafe in Jonkershoek for a breakfast that had been five years in the making. They came from different countries, different disciplines and different points in their careers. Some had spent four months at CERI. Others had spend years. But the training, the network and the shared purpose had stayed.

CERI Director Prof Tulio de Oliveira opened the morning grounding the gathering in what it represented: building Africa's capacity to detect, respond to and contain its own epidemics, and more than 900 scientists trained in that time, now working across health systems, universities, ministries and research institutions on the continent. The reunion was not a ceremony. It was a measure of what had been built, and a conversation about what comes next.

The chisel and the hammer

One of the fellows in the room offered an image that shaped the morning's conversation. A chisel is nothing without the hammer. It is the strike of the hammer that drives the chisel through stone. Dr Juandre Klopper, an SU MBChB alumnus and current African STARS MBA in Healthcare Fellow at Stellenbosch Business School, recalled a poem about a chisel and a hammer that has stayed with him since his undergraduate years. For the scientists gathered in Jonkershoek, each at a different stage of being shaped, the metaphor resonated deeply.

"To break through stone, the chisel must be willing, prepared and sharpened. If we want to achieve extraordinary things, we must be prepared to do the hard work," he said.

For Klopper, Stellenbosch has been the site of that sharpening more than once; first through medicine, now through the STARS fellowship.

"Stellenbosch University has not only sharpened me through my medical training; it continues to teach and inspire me through the STARS fellowship and the achievements and encouragement of its alumni. It is remarkable what can be achieved when we truly apply ourselves and work together, and here, I have witnessed this firsthand."

Can African scientists make scientific money?

Levi Hosea, a Young Professional Programme fellow from Madagascar currently placed at Institut Pasteur de Dakar through African STARS, brought a different kind of energy to the room. His provocation was simple and drew both laughter and recognition: Africa's scientists need to start making what he called "scientific money"; building and commercialising solutions to the problems the continent is uniquely positioned to solve, rather than leaving that work to others.

Behind the humour was a sharper argument. Scientific discovery without a viable path to market does not reach patients. Training without commercialisation thinking produces knowledge that stays in laboratories. The next generation of African scientists must be as serious about building and funding as they are about research.

"Science is the start, but business is the way. Scientific innovations which lack business implementation will fail." - Levi Hosea

Stay connected, mobilise resources, build together

Dr Richard Gordon brought a complementary perspective to the morning's conversation. Speaking to the fellows directly, he emphasised that the relationships in that room were not incidental to their scientific careers; they were central to them. He encouraged fellows to stay connected with one another and with CERI, to actively mobilise resources and share them across the network, and to see collaboration not as a nice-to-have but as a professional responsibility for anyone serious about advancing African science.

His message was clear: the work of building Africa's epidemic response capacity does not happen in isolation. It happens when scientists who have been trained together continue to find each other, fund each other and open doors for each other long after the fellowship ends.

It was a thread that ran through the whole morning. The fellows in that room carry not just skills but a network with the potential to shape how Africa trains, funds and sustains its scientific workforce for the next generation.

The reunion is the beginning

The breakfast wrapped at midday. Fellows moved on to the Matie Winemakers Showcase at the Alumni Clubhouse, where more than 20 Matie winemakers poured for a crowd of Stellenbosch alumni from across the decades. Later that evening, the group joined hundreds of Maties at the Endler Hall for the Matieland Concert, featuring a special performance by the Stellenbosch University Choir on its 90th anniversary.

Part of a university-wide gathering that for one weekend a year turns Stellenbosch back into the place that shaped them, CERI's reunion added something new to that tradition. A community of African scientists, asking not just where they had been, but where the continent needs them to go next.

CERI turns five. The chisels continue being sharpened.



Welcome, Ronel!

Bringing financial expertise to CERI's research.

A qualified Professional Accountant (SA) and CIMA Management Level professional, Ronel brings more than 15 years of accounting and financial management experience to CERI's Grants and Contracts team at the CERI-BMRI office at Tygerberg.

"CERI's impact and investment in young professionals on the African continent is quite remarkable in shaping the future for Africa," she says.

At CERI, Ronel will support the financial management of research projects, including budgeting, expenditure tracking, reporting, and forecasting. She believes good financial management is essential to ensuring funding is used responsibly, projects remain sustainable, and funders have confidence in their investments.

Her approach to work is grounded in values she learnt from her parents: humility, a strong work ethic, accountability, and integrity. "I believe strongly in doing the right thing, even when no one is watching," she says.

Joining CERI also marks a return to familiar territory. Ronel holds a BCom Honours in Management Accounting from Stellenbosch University. "It is a privilege to be back as an employee at the University that shaped my thinking and prepared me for my career," she says.

Outside work, Ronel enjoys camping, hiking, safaris, and adventures with her husband and teenage son. She describes herself as an "introverted extrovert" and looks forward to getting to know her new colleagues.



Future Scientists

Opening young minds to scientific possibilities.

text & photo: **Paul Harris**

KRISP recently welcomed 24 Grade 9 learners and two facilitators from IkamvaYouth, representing four high schools in Durban's Chesterville area, for a day of discovery, learning, and hands-on science.

The visit came as learners prepare to make subject choices that will shape their future academic and career paths, giving them a glimpse of science beyond the classroom.

Learners were introduced to DNA and genomic sequencing, while KRISP's Masters and PhD students shared their own academic journeys and experiences of pursuing careers in science.

They also put science into practice, building DNA strands using candy and extracting DNA from frozen strawberries.

"The learners have been so excited to come to KRISP and experience science in action," said Sibonelo Mdunge, IkamvaYouth Branch Manager for the Chesterville area.

"We are very grateful to the team and sponsors for making this opportunity a reality for our learners."

KRISP hopes such initiatives will inspire curiosity, build confidence, and encourage young learners to see themselves as the scientists of tomorrow.



When African Data Drives Decisions

What is the value of data? African STARS YPP fellow Elvis Poku-Adusei reflects on how African data can shape policy.

text: **Elvis Poku-Adusei** photos: **Supplied**





In many African countries, governments face immediate, visible demands: roads that must be built, hospitals that need equipment, energy systems that must function, and economies that must grow. Against that backdrop, data can feel abstract. It does not pour concrete or lay asphalt.

Research continues. Papers are published. Biobanks grow. But the connection to the everyday lives of Africans remains fragile. With this, African data sits in a space of quiet neglect, not because it lacks value, but because it has not yet been embraced as urgent and essential.

The answer lies in translation, not across languages, but across worlds: from data to decisions, from discovery to delivery, from journals to policy. Policymakers do not fund complexity; they fund clarity. They do not invest in possibility; they invest in outcomes. If data cannot clearly show how it improves treatment decisions, reduces healthcare costs, or strengthens health systems, it will always stand behind roads and infrastructure in the queue of national priorities.

But here lies a deeper irony. Africa is not poor in data. It is rich in data in ways the world is only beginning to grasp. The continent holds the greatest human genetic diversity on Earth. Every variation, every adaptation, every evolutionary pathway tells a story that began here. Humanity did not merely pass through Africa. Humanity began in Africa.

So how is it that the most genetically diverse populations on the planet are the least represented in the datasets shaping the future of the world? This has real consequences: a borrowed lens can never fully reveal a landscape. A model trained elsewhere is applied here. A prediction is made and a decision follows. But what if the model is wrong and assumptions do not hold?

As an African proverb reminds us: “Until the lion learns to write, every story will glorify the hunter.” For too long, Africa has been the subject of data, not its author. The measurements exist; the meaning is shaped elsewhere.

This is why translation is not optional. It is urgent. Data generated in Africa must use the language of policy

to answer Africa's most pressing questions. When those answers become clear, something shifts. Data stops competing with infrastructure and becomes part of it, not roads of asphalt, but roads of knowledge that guide better decisions for improved lives.

This is not a hypothetical shift. It is already visible in the work of the Climate Amplified Diseases and Epidemics consortium, known as CLIMADE, which links genomic surveillance directly to public health response across Africa and beyond.

Rather than treating sequencing as an end in itself, CLIMADE produces regular summaries written specifically for policymakers, translating findings on dengue, cholera, Rift Valley fever, and other climate sensitive pathogens into guidance that health ministries can act on.

When cholera spread across Malawi, CLIMADE researchers adapted whole genome sequencing protocols in real time to trace its movement. When dengue was found circulating quietly in West Africa, CLIMADE mobilised reagents and sequencing capacity to characterize it properly. This work is led from within the continent by scientists such as Prof Tulio de Oliveira at the Centre for Epidemic Response and Innovation (CERI) at Stellenbosch University.

This is translation in practice: data that does not stop at publication, but feeds into surveillance systems and policy documents that ministry officials can use to make informed decisions and save lives in affected communities.

But translation alone is not enough. It must be accompanied by ownership. Data must not simply leave the continent to be analysed elsewhere. Capacity must not be temporary. Training must not end at workshops. African scientists must not only participate in global science, they must lead it.

So the path forward is not mysterious, even if it is difficult. We need to build systems that generate African data at scale, validate tools within African populations before deploying them, and integrate data insights into healthcare systems in ways clinicians and policymakers can actually use. Engage policymakers, clinicians, and communities not at the end of research, but at its beginning, from the first objective to the very last. And, most importantly, research funders should make evidence of translation into clinical practice, public health, or policy part of how research success and continued support is assessed.

This is not a call for Africa to catch up. It is a call for Africa to lead. Because when the most genetically diverse populations in the world are fully represented in the data that drives health systems, the benefits will not be local. They will be global.

And perhaps then we will finally answer the question we began with. What is the value of data? It is not in how much we collect. It is in how many lives we improve.

Stepping Into Leadership

Finding connection, belonging, and room to grow.

When Beatrice Mbamba arrived at Stellenbosch University as an African STARS Fellow at CERI, finding a community among fellow postgraduate students helped make the transition easier. Through events and activities organised by the Tygerberg Postgraduate Student Council (TPSC), she became increasingly involved in the postgraduate community beyond her own academic work. "TPSC made me realise the importance of having people around you while navigating postgraduate life and, somewhere along the way, I found myself wanting to contribute to that community too," she says.

On 18 September, Beatrice was inaugurated as Secretary of the TPSC for the 2026/27 term. "When I started my African STARS Fellowship journey, I wanted to step outside my comfort zone and embrace opportunities that would help me grow, and this is one of those moments."

The experience is also shaping how she understands leadership. "I am beginning to understand that leadership is much more than a title," she says. "It is in the small, unseen things like listening when someone needs to be heard, noticing when someone is struggling and connecting them to the right support."

It can also be as simple as helping people know where to turn, she says, and creating spaces where everyone feels that they belong. "We may never know the full impact of those moments on someone else's journey, but now I get to play a small part in building that community for others – and I am excited for this chapter."



Seeing What Surveillance Cannot Yet See

Levi Hosea is exploring how genomic data can add a new dimension to infectious disease surveillance in Madagascar – helping scientists understand not only where disease is spreading, but how viruses are evolving and moving through populations.

text: **Katrine Anker-Nilssen** photo: **CARE-IPD**

For Levi, a handful of polio sequences could be the beginning of something much bigger. Working in infectious disease surveillance and outbreak response, he is exploring how genomic information can be combined with the epidemiological data already used to track vaccine-preventable diseases in Madagascar. His immediate interests include polio, measles, and rotavirus – and the possibility of using their genetic sequences to reveal patterns of viral evolution and transmission that conventional surveillance alone cannot show.

His year as an African STARS YPP fellow at CARE, Institut Pasteur de Dakar (IPD), introduced him to new scientific approaches and, ultimately, to the next stage of his training. Levi's earlier disease-modelling work drew primarily on epidemiological and population data, but collaboration with IPD's virology department exposed him to analyses combining epidemiological, climatic, geographical, population, and molecular data.
When a call for the Workshop on Virus Evolution and Molecular Epidemiology (VEME) was shared internally, he saw an opportunity to develop this further. At VEME 2026 in Stellenbosch, South Africa, Levi learnt more about the structure and analysis of genomic data, including the mathematical foundations of different analytical tools. He is now looking at how to incorporate genomic data into modelling approaches already grounded in epidemiological and clinical information.



One exercise using yellow fever virus data was particularly significant. By adding geographical information to investigate viral evolution over time, Levi explored how genomic results could be interpreted alongside other data, and the importance of collecting complete metadata for future studies. The training also strengthened his confidence in interpreting phylogenetic trees and understanding the possibilities and limitations of using them to infer how viruses evolve and spread.

"VEME complemented my fellowship by giving me highly specialised knowledge and skills that fit my ongoing scientific work and future research on virus evolution."

Levi is now working to access genomic data for polio, measles, and rotavirus in Madagascar, with the aim of analysing sequence data alongside population and epidemiological information. While the country has established surveillance systems for vaccine-preventable diseases, Levi says genomic surveillance is not yet incorporated into the surveillance performance indicators he works with, and that infrastructure and technology remain barriers to its wider implementation.

A small number of polio sequences are already available for Levi to begin exploring the approach. He hopes to use them for a proof of concept examining transmission mechanisms by combining genomic information with epidemiological models already in use. If the approach demonstrates value, he hopes it could help build the case for greater integration of genomics into disease surveillance in Madagascar.

"For my country, where many viral diseases are still shaking the health system, I am deeply convinced that the use of genomic surveillance can reduce the disease burden significantly."

The knowledge is also beginning to reach others. Levi has planned a two-hour session with The Expanded Programme on Immunization (EPI) – a global initiative launched by the World Health Organization in 1974 to ensure universal access to life-saving vaccines for children – to introduce virus evolution hypothesis testing using the available polio sequences, with further sessions possible if there is interest.

Alongside this scientific work, Levi is pursuing another idea that emerged during his African STARS fellowship. RRegalis began as his capstone project, introducing him to the possibilities of building a business around public health and health technology. He is now working towards establishing it as a start-up.

"Before African STARS, I thought public health was only about waiting for grants and charity."

His scientific and entrepreneurial ambitions are increasingly connected. Levi is exploring the feasibility of a healthtech business serving Madagascar, Comoros, and Seychelles, while his growing expertise in genomics has opened up possibilities for developing products and services that draw on molecular information as well as more conventional disease surveillance.

For Levi, this also raises a wider question about how Africa can make better use of its growing scientific capacity. He sees increasing demand for health services alongside a growing pool of trained African scientists for whom employment opportunities have not expanded at the same pace.

"African scientists and professionals wait for jobs and opportunities while the population is expecting more and better services and care."

Levi believes African-led scientific enterprises could help bring those needs together – developing locally relevant services while creating opportunities for scientists and other skilled professionals. His own plans are still at an early stage, but they point towards an ambition in which scientific capacity creates value beyond an individual career.

That ambition can already be seen on a smaller scale: in polio sequences being explored in new ways, genomic knowledge being introduced to other public health professionals, and a start-up idea that has continued beyond the fellowship in which it began.

From a handful of sequences to a bigger ambition for genomic surveillance, Levi is exploring how deeper scientific understanding can translate into stronger public health – and, ultimately, more opportunities for African scientists to put their expertise to work.

Opening Doors For Others

Dr Masala Mugeri reflects on how far she has come.

Completing her PhD at the University of Cape Town marks a major milestone for African STARS fellow Dr Masala Mugeri.

"I left home in 2022 without even knowing where Cape Town Station was," she says. "I simply trusted that the bus would take me there – a village girl in a big city with a big dream and a lot of uncertainty."

The journey taught Masala not to compare her path with others, but to understand her own purpose and keep moving forward.

She now hopes to encourage the young people she mentors, particularly those from rural communities. "The journey may not be easy, but it is doable."

Now an African STARS Fellow at CERI, Masala sees her PhD as a foundation for the next stage of her work – and for helping others progress too.

"I have earned my stripes and now I want to pass them on. The goal is no longer just to succeed. It is to use what I have learned to open doors for others, contribute to better health outcomes, and make an impact."



Connecting Climate Science

Reflections from the ASSAf–Leopoldina workshop on the connections between climate science and mental health, held from 8–10 September 2026 in Pretoria, South Africa.

text: **Dr Chanelle Mulopo** photos: **Supplied**

How can research better capture the mental health impacts of climate change, and how can scientific evidence inform policy and action? These questions shaped the international workshop Climate Change and Mental Health: Comparative Risk Pathways, Vulnerability, and Resilience, jointly hosted by the Academy of Science of South Africa (ASSAf) and the German National Academy of Sciences Leopoldina at the University of Pretoria from 8 to 10 September 2026.

The workshop brought together 13 selected early-career researchers-seven from South Africa and six from Germany-alongside established scholars. For me, participating in this highly competitive international gathering was an opportunity to share my research, learn from colleagues working in different contexts, and reflect on how collaboration can advance climate change and mental health research.

I opened the early-career researcher presentations with my talk, "Climate Change and Mental Health in Africa: A Multi-Country Analysis of Lived Experiences and Pathways Following Extreme Weather Events." Drawing on findings from the Wellcome Trust-funded WEMA project, I presented insights from a participatory digital storytelling study involving 37 community-based co-researchers across South Africa, Mozambique, Burkina Faso and Kenya. The research explored how people experience the mental health impacts of extreme weather events within the social, material and environmental conditions of their everyday lives. It highlighted how distress can persist beyond the immediate event, particularly when recovery is incomplete and communities remain exposed to further environmental threats.



Broadening perspectives through scientific exchange

Across the first two days, keynote speakers and early-career researchers presented their work and engaged in discussions on the challenges and opportunities in climate change and mental health research. The conversations highlighted the need for more longitudinal studies to understand how mental health outcomes evolve over time, as well as the value of perspectives such as positive psychology and exposome science.

Participants also reflected on gaps in the evidence base, including the need to investigate a wider range of climate-related events, such as wildfires, and to strengthen facility-based research examining healthcare admissions in relation to environmental exposures. These discussions reinforced the importance of expanding research capacity and integrating mental health more meaningfully into climate adaptation planning.

From dialogue to policy

One of the most engaging elements of the workshop was the World Café, which brought researchers together in small, mixed-country groups. Each group included two South African researchers and one German researcher. Four thematic tables explored extreme weather events and mental health, heat and mental health, community vulnerabilities and mental health, and policy.

As groups rotated between tables, participants responded to guiding questions, exchanged perspectives and built on one another's contributions. The discussions were subsequently synthesised into a draft policy brief, connecting the scientific exchange with shared research priorities and policy recommendations.

The final day focused on consolidating the research gaps and recommendations emerging from these conversations. Senior researchers encouraged us to look beyond our individual projects and consider the broader implications of our work. This collective reflection demonstrated the value of engaging across disciplines and national contexts to identify questions that may otherwise remain overlooked.

The value of international collaboration

The workshop was a reminder that, while climate-related mental health challenges are experienced differently across countries, there are important opportunities for shared learning. South Africa and Germany bring different environmental, social and health-system contexts to these discussions. Bringing researchers together made it possible to explore common concerns while recognising the importance of context-specific evidence.

For me, one of the most valuable outcomes was the opportunity to present my work, engage with established scholars, and learn from early-career researchers whose approaches and experiences differed from my own. The workshop demonstrated how international scientific dialogue can move beyond sharing findings to identifying research gaps, strengthening collaboration and informing policy.

For CERI, these exchanges reflect the value of interdisciplinary research and international collaboration in addressing complex and emerging public health challenges. They also create opportunities to connect climate-related health research with broader conversations about population health and evidence-informed responses.

As climate-related events continue to affect communities, sustained collaboration will be essential to producing evidence that reflects lived experiences and supports meaningful responses. The ASSAf-Leopoldina workshop offered an important space to advance that conversation.



STARS Fellows In The Spotlight

Levi Hosea and Kennedy Mulungu share their innovation journeys.

Two African STARS fellows have recently been featured by major African media platforms, highlighting how they are translating science and innovation into solutions for challenges across the continent.

Levi Hosea, a 2025 African STARS Young Professional Programme fellow based at CARE-IPD, was profiled by *Africa.com* about his journey from scientist and public health programme manager to health entrepreneur. The feature explores his work on RRegalis, a health-tech ecosystem designed to improve access to healthcare and medicines, and how the fellowship has shaped his approach to combining science and business. “Preparation for greater responsibility,” is how Levi describes the fellowship.

Read more: https://africa.com/interviews/levi-hosea-2025-african-stars-young-professional-programme-fellow

Kennedy Mulungu, a 2025 African STARS Young Professional Programme fellow based at CERI, was featured by *AllAfrica* for his work developing biodegradable sanitary pads and wound dressings from alginate derived from seaweed. The article traces his journey from scientific research towards entrepreneurship and his ambition to turn African research into locally manufactured products that respond to community needs. Kennedy describes the African STARS fellowship as a “bridge” that exposed him to venture building, bioprocessing, product development, and commercialisation.

Read more: https://allafrica.com/stories/202609300448.htmlstories/202609300448.htmlstories/202609300448.html





Creativity, Collaboration and Impact

Africa is not short of the scientific expertise needed to solve its most pressing challenges, but expertise alone is not enough. For research to translate into meaningful solutions, scientists need to work outside of the box – and that means thinking creatively, engaging with diverse stakeholders and working beyond academia.

text & photos: **Ameera Crew**

This was the focus of the Creativity, Collaboration and Impact (CCI) Workshop, delivered to the current cohort of African STARS Fellows in collaboration with the Public Squares Initiative and CERI's Social Innovation Unit (SIU). Taking place from 7 – 9 September 2026, the workshop aimed to equip fellows with the knowledge and skills to engage communities, collaborate effectively, and ensure their solutions are impactful and sustainable.

Prof Brian Fox opened the workshop with a powerful statement: "Science is for people". It was a reminder that research has the power to improve lives, influence policy and drive innovation. However, as societal issues grow more interconnected, scientists need to collaborate and work beyond academia for science to be responsive and relevant.

Ongoing problems such as climate change, disease outbreaks, mental health and unemployment are too complex for any single discipline to solve alone. They require multiple stakeholders in the research process and for problem solving to be approached in a creative way. This is what it means for research to be engaged and collaborative: working closely with those most affected by an issue, and working not just with other academics, but with government and industry too.



The CCI Workshop recognised that scientists need to be trained in this kind of research. Engaged, collaborative work calls for a different skill set than what traditional academic training typically provides including co-producing knowledge with non-academic partners, science communication, public engagement, and participatory research design.

Over the three days of the workshop, participants were guided by 5 questions:

1. What challenge are we seeking to address?
2. What change are we trying to achieve?
3. Whose knowledge, experience, and expertise are needed?
4. How should we collaborate and engage?
5. How can we maximise the impact of our research or innovation?

These questions anchored participants' thinking as they developed their approach to their challenge.

On day one, fellows identified a challenge they wanted to work on throughout the workshop. Divided into four groups, each group explored an important and relevant challenge facing the African continent today:

1. How do we make Africa malaria-free by 2030?
2. How can we improve poorly designed cities?
3. How can we build a framework for safe disposal of unused and expired medication?
4. How can we make temperature-sensitive medication accessible in areas without reliable refrigeration?

Each team mapped the knowledge, skills, and expertise needed to address their challenge, formed an initial team composition, and identified key stakeholders such as community leaders, policymakers, businesses, and organisations.

Day two focused on meaningful collaboration and community engagement. Fellows practised creative research methods such as digital storytelling, context

mapping and photovoice. They considered why, when, with whom, and how each could be used, and used these insights to develop a collaboration and engagement strategy with their identified stakeholders.

Dr Astrid Treffry-Goatley, Programme Manager of the Public Squares Initiative and co-lead of the SIU, explained the thinking behind the workshop's design: "We wanted to move the fellows from thinking individually about their research and the techniques that they're learning, towards working as teams so that they can identify a challenge, think about the change they want to get to, and start working on the mechanisms and people they'd like to work with along the journey."

Throughout the workshop, fellows engaged with short presentations, practical and creative activities, reflections, and discussions, alongside dedicated time to develop their team's *Collaboration & Impact Canvas* – a large, shared sheet of paper used to think through and develop a research or innovation project together. This approach is widely used in innovation, entrepreneurship, and impact planning, and was adapted specifically for the workshop.

By day three, each team's canvas had taken full shape. Drawing on the strategies developed over the course of the workshop, and informed by a presentation from Bushra Razack, former CEO of Philippi Village, on the successes, challenges, and innovative thinking behind the hub's development, fellows identified concrete next steps to ensure their research delivers meaningful impact for its intended beneficiaries.

Each group developed a distinct "pathway to impact" suited to its unique challenge. Grounded in creative and novel approaches, these pathways were geared toward ensuring that any resulting change would be sustainable, relevant, and supported by communities. The pathway integrated key insights from across the three days, including which stakeholders to engage and when, which creative research methods could involve communities in the research process to capture their perspectives and experiences, and how emerging challenges could be addressed through innovative approaches.

As Bushra aptly put it: "Be open to learning from the community around you, the people experiencing the problem hold knowledge and experience you may never find on paper."

Zooming out and returning to the five guiding questions, the pathways told the story of each team's journey from identifying their wicked problem and the change they hoped to see, to understanding who needed to be involved and how, right through to a concrete set of actions for moving their research into action. It served less as a fixed plan and more as a living map, one that fellows could return to and adapt as their work continued beyond the workshop.

The way research gets done matters. Creativity, collaboration, and meaningful engagement should not be add-ons in the research process. They should be integrated from the very start to strengthen research, broaden its relevance, and increase its potential to contribute to sustainable change. This is what it means to move from ideas to impact: approaches challenges with creativity and not working in isolation, but alongside those who make solving Africa's biggest challenges possible.

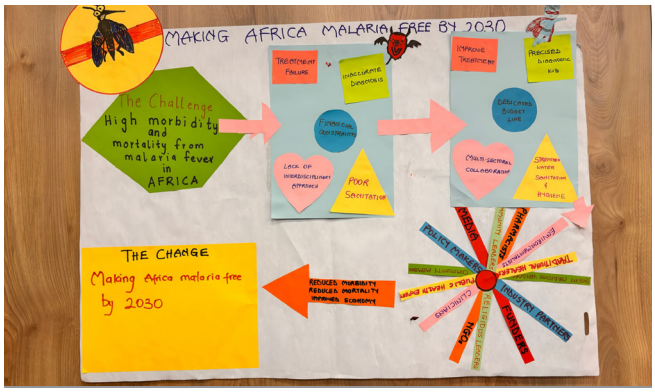
Voices from the Workshop

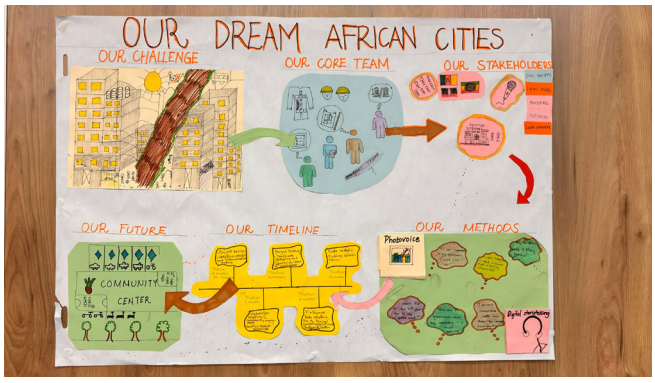
"What stayed with me most was that impactful research is not just about asking "What can we discover?" but also 'Who are we designing this for, and who needs to be at the table?'" ***– Bridgette Galafa***

"The workshop reinforced that researchers do not always have all the answers. The people experiencing a problem understand aspects of it that may never appear in our datasets or scientific literature" ***– Nzube Ekpunobi***

"If the people who live with the problem are not part of creating the solution, we may be solving the problem we think exists, not the problem that actually exists."
- Abduljalal Nadabo

"This week's workshop on transdisciplinary research reminded me that real impact starts with community at the centre, not as a footnote, but as a stakeholder from start to finish." ***– Elvis Poku-Adusei***





Reading What Viruses Leave Behind

From tracing HIV evolution to understanding mpox transmission and the influence of climate on West Nile virus, researchers at VEME 2026 explored what genomic data can reveal about how viruses evolve and spread – and why interpreting those signals requires care.

text: **Katrine Anker-Nilssen** photos: **CERI Media, Charlie Sperring**

A viral genome carries traces of its history. As viruses replicate and spread, genetic changes accumulate. Comparing those changes across samples can help researchers investigate how viruses are related, how quickly they are evolving, and how viral populations have changed over time.

But turning sequences into scientific evidence is not as simple as building a phylogenetic tree.

That distinction emerged repeatedly at the 29th International Bioinformatics Workshop on Virus Evolution and Molecular Epidemiology (VEME), hosted by Stellenbosch University's Centre for Epidemic Response and Innovation (CERI) at Bertha Retreat in Stellenbosch from 6 to 11 September.

Across two training modules – *Phylogenetic Inference and Evolutionary Hypothesis Testing* – participants worked through methods for moving from genomic sequences to evolutionary and epidemiological questions, applying them to real datasets and their own research.


Lovisa Lindquist

For Lovisa Lindquist, a first-year PhD student at the Lund University Virus Centre in Sweden, the focus is on viral evolution within the host.

Lindquist studies what happens during the first weeks and months after HIV-1 infection, examining how the virus population and host immune system change. Studying this acute stage is difficult: people are not always identified this early, while the longitudinal samples needed to follow changes over time can be difficult to obtain.

Phylogenetic analysis allows her to move beyond simply identifying differences between individual viral sequences.

"Looking at sequences can give you an idea of whether the virus seems to change much or not, and which parts of the genome are more or less variable," she explains.

By incorporating information such as time through phylodynamic analysis, researchers can investigate which viruses are more closely related, how quickly they evolved, and approximately when ancestral viruses existed – providing clues to how currently circulating viruses acquired particular characteristics.

From relationships to transmission

The same evolutionary relationships can be examined at a very different scale.

In the Botswana Harvard AIDS Institute Partnership, PhD researcher Patrick Mokgethi uses genomic and phylogenetic approaches to study HIV-1 evolution, drug resistance, and transmission dynamics, with a particular focus on migrant populations and people living with HIV.

Comparing viral sequences can reveal groups of genetically related infections and help researchers investigate how viral lineages have emerged and spread.





Add information about when and where samples were collected, and genomic data can provide evidence about aspects of an epidemic's history.

But the genome is only one part of that picture. "Genomic data are most informative when combined with epidemiological, clinical, and demographic information," says Mokgethi.

Sampling dates, geographical and clinical information, exposure and surveillance data, and the representativeness of sampling can all affect what researchers are able to conclude.

That is particularly relevant to Mokgethi's research among migrant populations in Botswana, where phylogenetic analysis can help investigate broader patterns of connectivity between sequences and geographical regions.

"HIV transmission does not occur within isolated geographical boundaries," he says. "Viral lineages can circulate across countries and populations."

A genetic relationship between two viruses, however, does not by itself provide a complete reconstruction of who transmitted a virus to whom.

When a convincing tree is not enough

For Vjekoslava Kostanić, a veterinarian at the Croatian Veterinary Institute and first-year PhD student at the University of Zagreb, this need for caution was an important lesson from VEME.

Kostanić studies rotaviruses, including their genomic diversity, molecular epidemiology, and potential transmission between animal populations and across species. Rotaviruses have segmented genomes, meaning different genome segments can have different evolutionary histories through reassortment.

"One thing I learned at VEME is not to trust a pattern simply because it looks convincing on a tree," says Kostanić.

A seemingly clear cluster associated with a particular host or geographical area could reflect something biologically meaningful – or partly result from that population having been sampled much more extensively than others. Kostanić therefore looks at the statistical support for a grouping and whether the pattern remains plausible when other genome segments, metadata, and epidemiological information are considered.

"Especially when looking for possible transmission or host-switching events, I realised that a phylogenetic pattern can be very suggestive, but it is rarely enough on its own to prove what actually happened."

Mokgethi makes a similar point from his work with HIV. "Phylogenetic analysis provides evidence and estimates, rather than absolute certainty about transmission events," he says.

Incomplete sampling, sequencing quality, missing data, and analytical methods can all introduce uncertainty. Researchers therefore need to distinguish carefully between what their data support and what remains uncertain.

Building the evidence where outbreaks happen

In Nigeria, Dr Roland Funwei is applying these questions to mpox.

Dr Funwei, Acting Director of Research and Development at Bayelsa Medical University, is investigating the genomic, epidemiological, and biological factors influencing mpox transmission and evolution in Nigeria, including questions around sexual transmission.

Important uncertainties remain around viral shedding,

infectiousness, and different routes of transmission, while locally generated genomic and epidemiological data remain limited.

For Dr Funwei, phylogenetic approaches, combined with epidemiological and behavioural information, can help investigate whether apparently linked cases are genetically related and how viral lineages may be emerging and spreading through populations.

Integrating these approaches into routine surveillance in Nigeria could support earlier detection of emerging lineages, outbreak tracking, and a better understanding of transmission pathways.

“My broader goal is to contribute to the development of genomic surveillance capacity in Nigeria, particularly through strengthening institutional platforms for pathogen sequencing, bioinformatics, molecular epidemiology, and evidence-based outbreak response,” he says.

Asking more of genomic data

As genomic datasets grow, the questions researchers can ask of them are also becoming more sophisticated.

Dr Gina Cuomo-Dannenburg, a Schmidt Science Fellow at the University of Oxford’s Pandemic Sciences Institute, is an infectious disease modeller by training. Her current research investigates how environmental and climatic factors influence West Nile virus genetic diversity.

Her work uses Bayesian Skygrid methods, which can estimate changes in effective viral population size over time and investigate relationships with external variables such as temperature and precipitation.

Newer methods are beginning to move beyond assuming that those relationships are linear – an important development for Dr Cuomo-Dannenburg’s work examining how climatic and environmental factors relate to West Nile virus dynamics.

Improvements in computational capacity and efficiency could also change the scale at which molecular epidemiology can operate.

“With the current advancements, not just in AI but in computational capacity and efficiency, over the coming years we will see many molecular epidemiology analyses that have traditionally been too computationally intensive become feasible with the large genomic datasets that are increasingly the focus of our work,” says Dr Cuomo-Dannenburg.

The possibility is not simply larger analyses, but faster ones – potentially bringing sophisticated genomic analysis closer to the timescale on which public-health decisions need to be made. “I am personally very excited to see how this can help support countries in responding to public health threats and enable near-real-time responses to epidemics.”

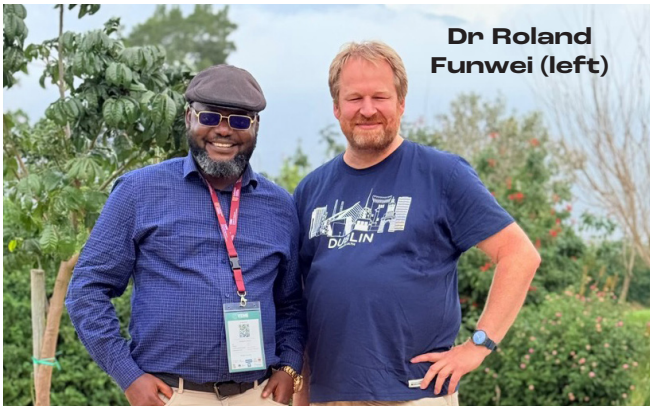
Learning to ask better questions

Across very different pathogens and research settings – HIV research in Sweden and Botswana, rotaviruses in Croatia, mpox in Nigeria, and research into the climatic and environmental drivers of West Nile virus study at Oxford – the same scientific challenge runs through the work: extracting information from genomic data without asking it to tell us more than the evidence allows.

For Lindquist, VEME 2026 also reinforced the potential value of these approaches before the next epidemic arrives.

“The role of phylogenetic and phylodynamic analyses in pandemic preparedness is often underappreciated,” she says. “Using phylogenetics to learn from previous outbreaks and pandemics, or for surveillance of currently circulating virus variants in a region, can help us act faster and in a more targeted fashion when the next outbreak occurs.”

The power of molecular epidemiology lies not simply in generating more sequences or more complex trees, but in knowing which questions those data can answer, what other evidence they need, and where uncertainty remains.





Using AI to Anticipate Poliovirus Risk

Olivier Adjagba is exploring how deep learning could help public-health teams identify where poliovirus type 2 may be detected next.





Poliovirus can circulate without being noticed. Most people infected with the virus do not develop paralysis, making surveillance critical for identifying transmission before cases emerge.

Olivier Adjagba, an MSc student at the South African Centre for Epidemiological Modelling and Analysis (SACEMA) and the Centre for Epidemic Response and Innovation (CERI), is exploring whether artificial intelligence can help provide an earlier warning.

Olivier recently presented part of his MSc research at IndabaX Benin, where he shared a deep-learning approach developed to forecast where poliovirus type 2 (PV2) may be detected across Africa.

The model uses recent information from individual countries to estimate the likelihood of PV2 being detected through a paralytic case or sewage surveillance during the following six months.

“The aim is to provide an early warning that could help public-health teams identify countries requiring closer attention,” Olivier explains.

Predicting where the virus may appear is challenging. Detection depends not only on whether the virus is circulating, but also on the strength of surveillance systems, including how frequently sewage samples are collected and tested. Available data also vary in completeness and quality between countries.

Olivier’s approach combines a normalising flows model with temporal encoders – including GRU, LSTM, and Transformer models – to identify patterns in data over time. The models draw on surveillance, immunity, vaccination, demographic, socioeconomic, environmental, and security indicators.

When compared with more traditional machine-learning approaches, the deep-learning models performed better on later test data, with the GRU-based model producing the strongest and most consistent results.

Importantly, sewage-surveillance data contributed most to the forecasts.

“Sewage testing can detect the virus even when no paralytic cases have appeared,” Olivier says.

The approach could therefore help identify countries and periods requiring closer monitoring or strengthened surveillance, although he emphasises that it should support rather than replace expert public-health assessment.

Olivier participated in IndabaX Benin online, but says the event provided an opportunity to share the research with an African audience interested in applying artificial intelligence to challenges affecting the continent.

“It also helped me think about how to explain the work clearly and how its results could be made useful to public-health teams.”

International Virology Honour

Professor Tulio de Oliveira, Director of the Centre for Epidemic Response and Innovation (CERI) at Stellenbosch University (SU), has been awarded the prestigious Gardner Lectureship Award by the European Society for Clinical Virology (ESCV), recognising his international contributions to virology, genomic surveillance and epidemic response.



De Oliveira, who was also the founder and Director of the KwaZulu-Natal Research Innovation and Sequencing Platform (KRISP) at the University of KwaZulu-Natal (UKZN), receives the honour at the 28th Annual Conference of the European Society for Clinical Virology (ESCV), taking place in Porto, Portugal, from 16–19 September. For him, receiving the award in Portugal is particularly special as a Portuguese citizen who was appointed a Commander of Portugal's Order of Merit by President Marcelo Rebelo de Sousa in 2023.

Established in 1995 through a bequest from the late Professor Phillip Gardner, who established the European Group for Rapid Viral Diagnosis, one of the predecessors of ESCV, the Gardner Lectureship recognises scientists with an international reputation in virology. The recipient is invited to deliver the Gardner Lecture at the ESCV Annual Meeting on a subject of importance to clinical virologists, with particular relevance to diagnostic applications and their practical impact.

De Oliveira joins a distinguished international group of Gardner Lecturers awardees whose work has shaped modern virology, including Prof Sarah Gilbert, Prof Charles Chiu, Prof Ralf Bartenschlager, Prof Malik Peiris, Prof Johan Neyts and Prof Florian Krammer.

For de Oliveira, the recognition reflects more than two decades of work at the intersection of viral genomics, bioinformatics, infectious diseases, and public health. He has pioneered the use of genomic surveillance to understand the evolution and transmission of viruses and other pathogens and to translate rapidly generated scientific data into actionable public-health intelligence.

His teams at KRISP and CERI gained worldwide recognition during the Covid-19 pandemic for the rapid identification and characterisation of SARS-CoV-2

variants, including the Beta and Omicron variants. Beyond individual discoveries, de Oliveira has focused on building scientific capacity, infrastructure and networks that have helped position South Africa and Africa at the forefront of genomic surveillance and epidemic preparedness.

"This is a very special recognition for me because clinical virology is ultimately about using science to protect people's lives," said de Oliveira, who is also Pro Vice-Chancellor: Industry, Business and Foundation Partnerships at Stellenbosch University.

"During my career, I have tried to combine genomics, bioinformatics and new technologies with public health so that we can identify emerging threats quickly and provide information that governments, clinicians, and communities can act on. Beta and Omicron showed the world what African scientists can achieve when we have the expertise, infrastructure and freedom to act rapidly."

He emphasised that the award also recognises the scientists who have worked alongside him across South Africa and the African continent.

"I receive this honour as an individual, but science at this scale is never an individual achievement. It belongs to the extraordinary teams at KRISP and CERI and to our collaborators across Africa and around the world. We have worked hard to demonstrate that Africa should not simply be a recipient of scientific knowledge and technology. We can generate discoveries, build technologies, train the next generation and lead scientific responses that benefit the entire world."

A special South African connection

The Gardner Lectureship also has a notable connection with South African virology. In 2003, the honour was awarded to Prof Robert Swanepoel of South Africa, internationally recognised for his work on viral haemorrhagic fevers and emerging viruses. More than two decades later, de Oliveira's recognition continues South Africa's representation among the internationally renowned virologists selected for the Gardner Lectureship.

For de Oliveira, this history is particularly significant given South Africa's long-standing expertise in emerging infectious diseases and the country's increasingly prominent role in global genomic surveillance.

"It is a great honour to follow South African scientists such as Professor Swanepoel, whose work on haemorrhagic fever viruses helped establish South Africa's international reputation in emerging-virus research," said de Oliveira. "South Africa has extraordinary scientific talent. Our challenge now is to ensure that we continue investing in that talent and create opportunities for the next generation of African scientists to lead globally."

Prof Sibusiso Moyo, Deputy Vice-Chancellor: Research, Innovation and Internationalisation at SU, congratulated de Oliveira on the international recognition.

"The Gardner Lectureship award is a significant recognition of Professor de Oliveira's scientific leadership and the international influence of research being conducted from South Africa," said Moyo.

"His work demonstrates what Stellenbosch University means by research excellence with societal impact. Through CERI and his extensive national and international collaborations, Professor de Oliveira has shown that world-class science conducted in Africa can fundamentally influence how the world understands, detects and responds to emerging infectious diseases.

"We are particularly proud that his work combines scientific excellence with an extraordinary commitment to developing people and infrastructure. His contribution is not only the discoveries his teams make today, but the generation of African scientists he is helping to prepare to confront the epidemics of tomorrow," Moyo added.

Professor Anil Chuturgoon, Acting Deputy Vice-Chancellor: Research and Innovation at the University of KwaZulu-Natal, also congratulated de Oliveira.

"UKZN warmly congratulates Professor Tulio de Oliveira on receiving the Gardner Lectureship award, an outstanding international recognition of a career that has transformed genomic surveillance and emerging-pathogen research," said Chuturgoon.

"I receive this honour as an individual, but science at this scale is never an individual achievement. It belongs to the extraordinary teams at KRISP and CERI and to our collaborators across Africa and around the world."

– Prof Tulio de Oliveira

"Through founding and leading KRISP at UKZN, he built a platform that demonstrated the ability of African science to operate at extraordinary speed, technological sophistication and global relevance. The identification and rapid communication of emerging SARS-CoV-2 variants showed how investment in African scientific capacity can protect not only South Africa, but the world.

"We are immensely proud of Professor de Oliveira's continued association with UKZN and of the scientists, students and collaborators at KRISP who contribute to this work. His recognition by the European Society for Clinical Virology reinforces an important message: some of the world's most consequential science on emerging infectious diseases is being led from Africa," Chuturgroon added.

De Oliveira's current work extends beyond responding to individual outbreaks. Through CERI, KRISP and initiatives including CLIMADE and GenPath Africa, he is working to integrate genomics, epidemiology, climate science, artificial intelligence and advanced data analysis to develop faster and more predictive approaches to epidemic intelligence.

At the same time, his focus remains on developing African scientific leadership, training young researchers and creating the infrastructure required for the continent to move from responding to epidemics to anticipating them.

"The next revolution in epidemic response will come from combining genomics with artificial intelligence, climate information, and real-time epidemiology," de Oliveira said. "Africa has already demonstrated that it can lead in genomic surveillance. Our ambition now is much bigger: to help build a scientific and innovation ecosystem that can predict threats earlier, develop solutions locally and contribute technologies and knowledge to the rest of the world."

"The next revolution in epidemic response will come from combining genomics with artificial intelligence, climate information, and real-time epidemiology."

– **Prof Tulio de Oliveira**

Room To Learn

Lessons beyond the grant proposal.

text: Dr Yuri Munsamy

This September, I had the privilege of co-facilitating the African STARS Fellows Grant Writing Workshop at the School for Data Science and Computational Thinking, Stellenbosch University, stepping outside my usual role as a grant writer at SACEMA to help early-career African researchers build the skills to fund their own work.

For me, facilitation has never been about conveying what I know or reading off a slide. It's about creating the right environment for open dialogue.

Two moments stood out.

The first came during the mock review panel, when groups swapped proposals and scored each other's work. One group defended their science passionately – this hits close to home and we know these methods. The reviewers were firm: we can't fund what we don't understand! We returned to the call text, the instructions were clear, that narratives must be written for a non-specialist audience. No matter how strong the science, if a reviewer needs a translation to follow the argument, it may never reach a fundable score.

The second moment was quieter but just as important. A conversation emerged about something rarely named in grant writing training: how early-career researchers navigate budget when collaborating with a senior PI who expects them to work for free. The room weighed it honestly, the value of network access, a co-authorship, a foot in the door against the cost of unpaid labour dressed up as opportunity. There were no easy answers, but the fact that the conversation happened at all felt like progress.

The fellows left with practical tools. But what I'll carry forward is the reminder that the most useful thing a facilitator can do is get out of the way and let the room teach itself.

Tracking Resistance in the Vaginal Microbiome

New research involving CERI's Prof Jo-Ann Passmore provides new insight into antimicrobial resistance and genomic diversity in a key bacterium associated with bacterial vaginosis.

A new study led by Kirsten Welp has provided one of the most detailed looks yet at antimicrobial resistance and genomic diversity in *Prevotella bivia* isolated from South African women. The bacterium is an important component of the vaginal microbiome associated with bacterial vaginosis (BV), a common condition linked to adverse reproductive health outcomes.

The researchers combined antimicrobial susceptibility testing with whole-genome sequencing to characterise 35 *P. bivia* isolates from 30 vaginal samples. Encouragingly, resistance to the antibiotics commonly used to treat BV – metronidazole and clindamycin – remained relatively low.

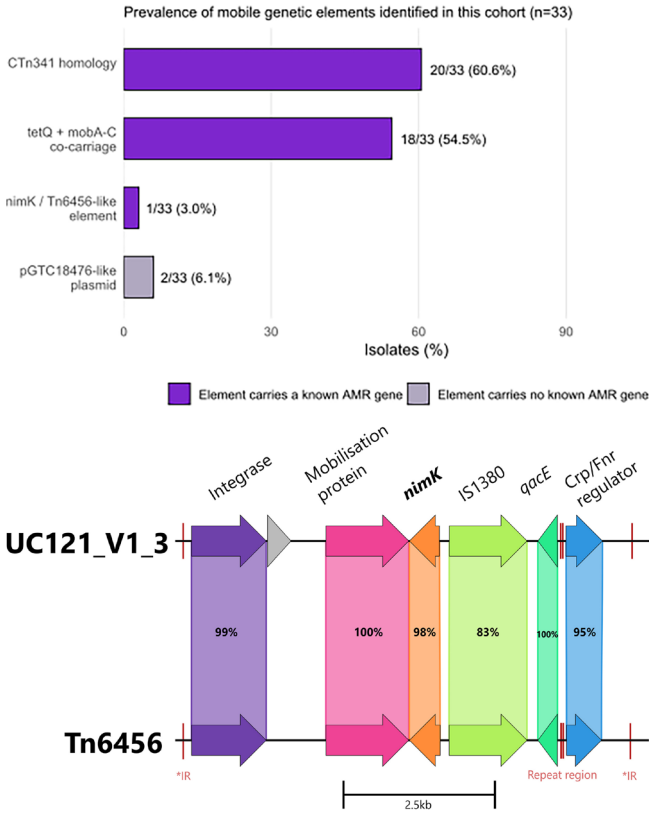
Genomic analysis, however, revealed several antimicrobial resistance genes. The tetQ and cfxA genes were detected most frequently, while a particular cfxA variant was associated with amoxicillin resistance. Importantly, the researchers also identified nimK in a South African vaginal *P. bivia* isolate for the first time. The gene occurred within a mobile genetic element, raising the possibility that resistance determinants could move between bacteria.

The study also found evidence that individual *P. bivia* strains can persist over time and that different strains can co-exist within the same individual. South African isolates showed genomic differences from many publicly available isolates originating in the United States, reinforcing the importance of generating locally relevant microbiome data.

The study was led by Welp, with Professor Brian Kullin as senior supervisor, and includes CERI Professor of Medical Virology and Microbiome Research Jo-Ann Passmore among its senior authors. Prof Passmore's research at CERI focuses on women's health, mucosal immunology, and the vaginal microbiome, with an emphasis on translating African microbiome research into improved diagnostics and interventions.

Read the full paper here: https://www.sciencedirect.com/science/article/pii/S1075996426000661

Figure 3 (below): *Mobile genetic elements (MGEs) identified in Prevotella bivia isolates. (A) Prevalence of MGEs identified in this cohort (n=33), coloured by whether the element carries a known AMR gene. CTn341 homology and the pGTC18476-like plasmid are detailed further in Supplementary Figs. 1 and 2, respectively. (B) Genomic organization of the Tn6456-like transposon carrying nimK in UC121_V1_3, aligned against the previously described Tn6456 reference. Percentage identity to the reference is shown within each gene arrow. IR: inverted repeat.*



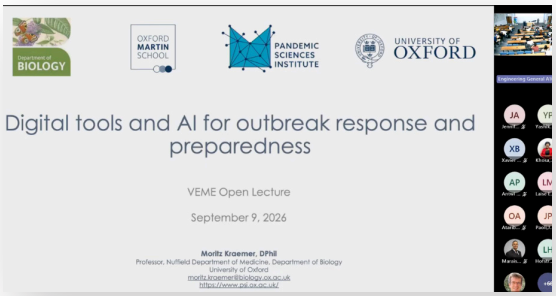
Media Coverage

Our work showcased in videos and featured on radio/TV.

Data, AI and the Future of Outbreaks

Recorded on 9 September 2026 at Stellenbosch University as part of the 29th International Virus Evolution and Molecular Epidemiology (VEME) Workshop, this open keynote lecture brings together two leading scientists at the frontier of data science and infectious disease. Speakers: Prof Houriiyah Tegally and Prof Moritz Kraemer.

Watch the full video here: https://www.youtube.com/watch?v=8wO1B7VXtBY





Genomic Surveillance

Every genome sequenced adds to a bigger picture. Surveillance depends on trained people and accredited systems as much as it does on sequencing technology, which is why building that capacity across the continent matters as much as the data itself. Featuring Prof Tulio de Oliveira. In partnership with SAVax and GIZ South Africa, Lesotho & eSwatini.

Watch the full video here: https://www.youtube.com/watch?v=j_l_s0GrGEM

A STIAS Public Lecture by Brian Fox

The fifth lecture in the #STIASPublicLectureSeries for 2026. These lectures, presented in person and via livestream, offer the general public, academics, and students, both locally and abroad, an opportunity to engage with the work of STIAS Fellows. STIAS Fellow Brian Fox will, on Thursday, 17 September, present a lecture titled “Outsmarting foot-and-mouth disease: From gene to vaccine”.

Watch the full video here: youtube.com/live/DKIbWrfnLWQ?si=xDQ3MsqAZp5LjhAB

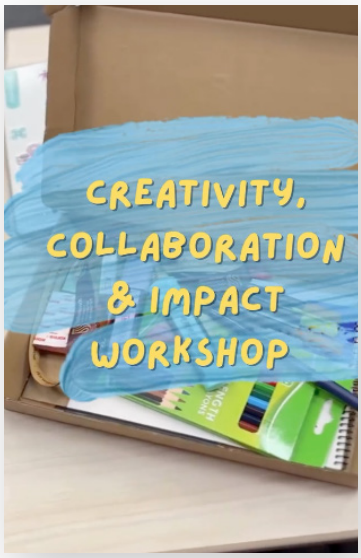


Can Africa Retain Its Scientific Talent?

Africa is producing a growing pool of highly trained scientists, but many researchers face a challenging transition from academic research into the world of work. In this conversation, Channel Africa is joined by Charleen Wormsberg, a South African biomedical scientist and 2025 Advanced and Translational Training Fellow with the African STARS Fellowship at Stellenbosch University.

Watch the full video here:
https://www.youtube.com/watch?v=a69CfrvgJFw





Creativity, Collaboration & Impact Workshop

African STARS Fellows took part in a three-day Creativity, Collaboration & Impact Workshop, delivered by Stellenbosch University's Public Squares Initiative in partnership with CERI's Social Innovation Unit. The workshop equipped fellows to engage communities, collaborate across and beyond academia, and think creatively about solutions to complex societal challenges – bringing scientific knowledge together with lived experience and diverse perspectives.

Watch the full video here:https://www.instagram.com/p/Ddl3MVqIR0K/?hl=en

Celebrating Deaf Awareness Month

September marks Deaf Awareness Month – celebrating the strength and contributions of the Deaf community. At CERI and the School for Data Science and Computational Thinking, we celebrate Honours student Trevolin Pillay, whose journey highlights the value of creating inclusive spaces where everyone can thrive and contribute.

Watch the full video here:
https://www.youtube.com/watch?v=1vBX8vmw5x8



The Future of Genomics is Being Shaped in Africa



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