CERI & KRISP Newsletter

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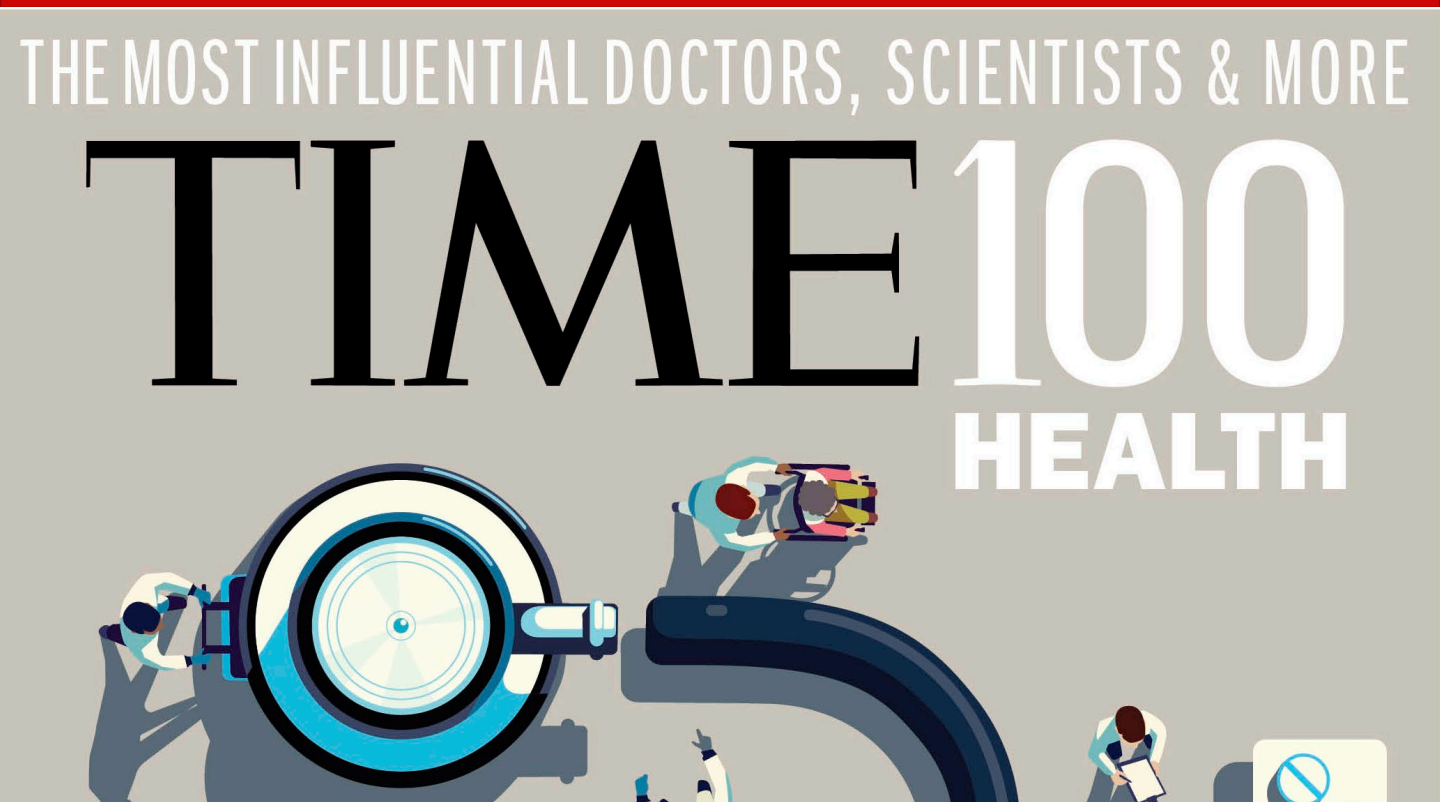

Introduction

In our feature story this month, we are thrilled to celebrate Professor Tulio de Oliveira, The Director, for his second recognition by TIME as one of the TIME100 Health 2024's most influential individuals globally.

In this issue, we delve into the challenges Africa faces in producing its own vaccines, highlight the CERI laboratory's preparation for ISO accreditation, reflect on the trajectory of HIV in South Africa, and share insights from our participation in key workshops and meetings, including the Virology Africa 2024, HIV Prevention workshop, the UWARN Annual Meeting in Taiwan and the Genomic data sharing for outbreak response meeting in Kenya.

Join us as we explore these critical topics shaping global health research and innovation.

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TIME 100: Professor Tulio de Oliveira selected for TIME100 Health 2024: 2nd recognition as one of world's 100 most influential individuals

[Stellenbosch, May 2, 2024] – TIME Magazine has recognized Prof Tulio de Oliveira in its inaugural 2024 TIME100 Health list, a new annual compilation that celebrates 100 individuals who have had the most impact on global health this year.

This recognition, determined by TIME's international network of editors, thought leaders, and previous honourees, marks De Oliveira's second appearance in TIME's influential rankings, following his previous inclusion in the 2022 TIME100 list of the world's most influential people. The full 2024 TIME100 Health list is available at time.com/time100health

De Oliveira is a world-renowned scientist on the field of genomics. He is the Director of the Centre for Epidemic Response and Innovation (CERI) at SU, Director of the KwaZulu-Natal Research Innovation and Sequencing Platform (KRISP) at the University of KwaZulu-Natal (UKZN) and Deputy Director of the Genomic Surveillance Unit at the Wellcome Sanger Institute in the UK.

In 2021, De Oliveira led a groundbreaking multidisciplinary team of researchers and scientists in the discovery of the Omicron variant of SARS-CoV-2, which swiftly emerged as the dominant global variant of the virus. In 2020, he led the team that discovered the SARS-CoV-2 Beta variant.

In the last decades, De Oliveira has led multiple networks of scientists in South Africa and Africa and in 2023, he launched the Climate Amplified Diseases and Epidemics (CLIMADE) consortium, a global consortium to characterize diseases and pathogens that are amplified by climate change.

Commenting on this remarkable achievement, Prof Sibusiso Moyo, Deputy Vice-Chancellor: Research, Innovation and Postgraduate Studies at SU, said: "Prof Tulio de Oliveira's tireless dedication to advancing scientific knowledge and his exceptional leadership in the field of genomics and bioinformatics exemplify the spirit of innovation and collaboration that defines our institution."

"I am deeply honoured to be recognised once again by TIME Magazine and to be included in the distinguished TIME100 Health list of 2024. This acknowledgment underscores the importance of collaborative research efforts in addressing global health challenges." De Oliveira expressed his gratitude

Read the full issue:
https://time.com/collection/time100-health/

Prof de Oliveira info at TIME100Health:
https://time.com/6966818/tulio-de-oliveira/

News: Why Africa is facing an uphill battle to make its own vaccines

Scientists at the Afrigen Biologics and Vaccines facility in Cape Town, South Africa CREDIT: Jerome Delay/AP

The continent – in dire need of its own production capabilities – could once again be at the back of the vaccine queue in the next pandemic. –*Verity Bowman, The Telegraph*

As governments vaccinated their people against Covid-19, the world was divided into rich and protected, and the poor and vulnerable. Africa, dependent on vaccines produced abroad, was left behind – despite the West's pledge of equitable vaccine distribution.

But one positive seemed to come from the chaos: Africa and the West came to the realisation that something had to change, and it had to be fast. The continent was in dire need of its own production capabilities.

As the pandemic raged, in March 2022, Moderna, the biotech spearheading a revolution in mRNA vaccine technology, announced it would build a $500 million manufacturing plant in Kenya. It would produce half a billion doses of its Covid-19 vaccine annually, it said.

The Telegraph

Read More: https://www.telegraph.co.uk/global-health/science-and-disease/why-africa-faces-an-uphill-battle-to-make-its-own-vaccines/

Prof. Tulio de Oliveira, director of the Centre for Epidemic Response & Innovation (CERI) and the KwaZulu-Natal Research and Innovation (KRISP), said mRNA is vital to hitting the Coalition for Epidemic Preparedness Innovations' aim of a 100-day response to the next pandemic.

But he said that "almost as every month" there has been a "decrease in interest" in mRNA production.
"It seems that there is a decrease of interest because of economic viability, which is quite strange, because they [pharmaceuticals producers] seem to have made billions in the pandemic."

Few African companies have the tools to produce antigens – a core ingredient for vaccine CREDIT: Simon Townsley

News: Bird flu virus has been spreading among US cows for months, RNA reveals

A cow is milked in Washington State.Credit: USDA Photo/Alamy

Genomic analysis suggests that the outbreak probably began in December or January, but a shortage of data is hampering efforts to pin down the source.

A strain of highly pathogenic avian influenza has silently been spreading among US cattle for months, according to preliminary analysis of genomic data. The outbreak likely began when the virus jumped from an infected bird to a cow, probably around late last December or early January. This implies a protracted, undetected spread of the virus — suggesting that more cattle than currently reported, across the United States and even in neighboring regions, could have been infected with avian influenza.

These conclusions are based on swift analyses following a dump of genomic data by the US Department of Agriculture (USDA), headquartered in Washington DC, into a public repository on 21 April.

But to scientists' dismay, the data do not include crucial information that would shed light on the outbreak's origins and evolution. Researchers also express concern that the genomic data wasn't released until almost four weeks after the outbreak was announced, on 25 March.

Speed in sharing data is especially important for fast-spreading respiratory pathogens that have the potential to spark pandemics, says **Tulio de Oliveira**, a bioinformatician at Stellenbosch University in South Africa.

The cattle outbreak shouldn't give the virus the ability to spread between people, but researchers say that it is important to be vigilant.

"In an outbreak response, the faster you get data, the sooner you can act," says Martha Nelson, a genomic epidemiologist at the US National Center for Biotechnology Information (NCBI) in Bethesda, Maryland. Nelson adds that, with every week that goes by, the window for controlling the outbreak narrows. "Whether we're not too late, to me, that's kind of the million-dollar question."

nature

Read More:
https://www.nature.com/articles/d41586-024-01256-5

Accreditation: CERI gears up for ISO/IEC17025 Accreditation for Genomics Services from KRISP previous ISO accreditation experience

In line with the Centre for Epidemic Response and Innovation (CERI)'s commitment to provide high quality genomics services, the laboratory is gearing up to achieve ISO/IEC17025 accreditation – an internationally recognized Standard for testing laboratories. This prestigious accreditation is internationally recognized and is key to laboratories aiming to demonstrate their operational competence and ability to produce valid and high-quality results.

CERI's pursuit of this Standard underscores its dedication to excellence and reliability in genomics, building trust in its services both domestically and globally. "Achieving ISO/IEC17025 accreditation will not only enhance our reputation but also assure our clients and partners of the rigor and precision in our testing procedures," remarked Lucious Chabuka, CERI's Acting Lab Manager.

The preparation for accreditation included a comprehensive training program held from April 15-18, 2024, spearheaded by industry experts Mponeng Poo from QualExpect Consulting Services and **Dr. Lavanya Singh, a specialist in Quality Management at KRISP, UKZN**. The workshop aimed to cover all aspects of the ISO/IEC17025 Standard to ensure the laboratory's processes are robust, reliable, and fit for purpose.

Dr. Lavanya Singh commented on the session, "**Our goal is to not just prepare the lab for accreditation but to instill a culture of continuous improvement. Understanding and implementing ISO/IEC17025 helps us ensure that our processes not only meet, but exceed the rigorous demands of quality in genomics testing.**"

Participants of the training session engaged in a variety of interactive activities designed to deepen their understanding of the Standard's requirements. Moreover, the session was also an opportunity for professional development, with attendees earning Continuing Professional Development (CPD) points. "The training was an eye-opener, integrating both fun and learning while equipping our team with the necessary tools to tackle the challenges of compliance," noted one of the laboratory technicians who attended the workshop.

With the accreditation process in full swing, CERI Laboratory is poised to set a new benchmark in genomics services, promising its clients and collaborators results that are not only technically valid but also consistently reliable.

Read More:
https://www.krisp.org.za/news.php?id=747

Virology in Africa: Virology in Africa Conference Highlights Advances and Collaboration in Disease Management

The Virology Africa 2024 conference, held from April 15-18 at the Protea Hotel in Techno Park, Stellenbosch, brought together a vibrant community of virologists from across Africa and beyond. Key themes of the conference included One Health, the management of emerging viruses, pandemic preparedness, and advances in vaccinology among others.

Participants ranging from postgraduate students to seasoned professionals presented their latest research in plant, human, animal, and bacterial virology through both oral presentations and poster sessions.

The conference facilitated a rich exchange of ideas and fostered networking opportunities, enabling attendees to share their insights and collaborate on solutions to critical virological issues affecting the continent. This interactive platform highlighted the importance of a united approach in tackling the challenges and advancements within the field of virology.

As the Centre for Epidemic Response and Innovation (CERI) and the KwaZulu-Natal Research Innovation and Sequencing Platform (KRISP), We are proud to have had Director Prof Tulio de Oliveira as a plenary speaker at the conference. He delivered an insightful presentation titled "Using Genomics to Respond to the SARS-CoV-2 Epidemic in South Africa." **Prof. de Oliveira** highlighted, **"Genomic tools have been pivotal in enhancing our understanding and combating COVID-19 within our regional context. These tools set a high standard for future genomic surveillance efforts."**

Read More:
https://www.krisp.org.za/news.php?id=746

In another significant contribution, **Dr. Gaspary Mwayika, a postdoctoral fellow at CERI**, presented his research on the introduction of Dengue serotype 1 during the 2019 outbreak in Dar es Salaam, Tanzania. His poster, titled "Introduction of Dengue Serotype 1 Virus During the 2019 Outbreak in Dar es Salaam, Tanzania," provided valuable insights into the transmission dynamics and potential control strategies for Dengue fever, a pressing health issue in many tropical regions. Dr. Mwayika stated, "Understanding the transmission dynamics of Dengue is crucial for developing effective control strategies in tropical regions prone to such outbreaks."

The event not only served as a platform for sharing research and knowledge but also strengthened collaborations among scientists dedicated to the study of viruses affecting both humans and animals. As the conference concluded, participants left equipped with new insights and connections, ready to further their work in understanding and combating viral diseases in Africa and beyond.

Prof Tulio de Oliveira delivering his plenary address

Inaugural Lecture: Prof. Frank Tanser Delivers Inaugural Lecture on "The Rise (and Fall?) of South Africa's HIV Epidemic: A Personal Perspective"

From left: Prof Elmi Muller (Dean of faculty of Medicine and Health Science), Prof Sibusiso Moyo (Deputy Vice-Chancellor: Research, Innovation and Postgraduate Studies), Prof Frank Tanser (Director of Population Health Innovation) and Prof Kanshukan Rajaratnam (Director of the School for Data Science and Computational Thinking***) Photo by Ignus Dreyer (The Stellenbosch Centre for Photographic Services)***

On April 23, 2024, Prof. Frank Tanser, the Director of Population Health Innovation at Stellenbosch University's Centre for Epidemic Response and Innovation, delivered an insightful inaugural lecture titled "The rise (and fall?) of South Africa's HIV epidemic: a personal perspective." His talk provided a deep dive into the past, present, and future of HIV epidemic management in South Africa, underlining both the achievements and ongoing challenges.

During his presentation, Prof. Tanser, a renowned epidemiologist with a rich background in the spatial and temporal dynamics of infectious diseases, discussed his extensive research on HIV, focusing on rural African communities most affected by the epidemic. He highlighted the critical need for effective intervention strategies to mitigate the impact of HIV and outlined his contributions towards evolving prevention and treatment policies across sub-Saharan Africa.

A highlight of his lecture was the discussion on the significant impact of antiretroviral therapy (ART) roll-outs, which his research helped to shape, influencing rapid changes in government policies and showcasing a measurable decrease in HIV transmission rates at the community level.

Read More : https://ceri.org.za/news/?token=748

Prof. Tanser also addressed the challenges ahead, emphasizing the need to maintain the momentum in combating HIV through increased ART coverage and innovative prevention strategies. He detailed his involvement in two significant NIH-funded projects aimed at refining HIV prevention strategies and increasing the uptake of preventative measures among men in rural communities.

Reflecting on global efforts to end the HIV/AIDS epidemic as a public health threat by 2030, **Prof. Tanser expressed cautious optimism.** He noted that, while tremendous progress has been made, achieving this goal will require continued political will and financial investment. **"Unfortunately, I don't think the world is on track to end the HIV/AIDS epidemic as a public health threat by 2030, but nevertheless, amazing progress has been made. Ending HIV as a public health threat will require sustained financial investment and commitment from many sectors,"** he said in July 2023.

Prof. Tanser's lecture not only highlighted the strides made in the fight against HIV but also reminded the audience of the persistent efforts required to sustain and build upon these gains. His dedication to his research and his role in policy influence continue to inspire those committed to public health in South Africa and beyond.

News: NIH UWARN Annual Meeting, Taiwan, April 2024
A Hub for Advancing Global Disease Research

The United World Antiviral Research Network (UWARN) recently held its annual meeting from April 22-24, in Kaohsiung City, southern Taiwan, bringing together key partners from the University of Washington, Senegal, South Africa, Switzerland, Pakistan, and Taiwan. The primary focus was on fostering collaboration and exchanging updates on ongoing research. Participants shared their latest findings, discussed the challenges faced, and highlighted their successes, reinforcing the network's commitment to advancing the global response to infectious diseases.

The event featured a series of enlightening presentations. Topics covered included long Covid and cohort recruitment strategies in Brazil and Pakistan, offering deep insights into the pandemic's prolonged effects. Discussions also touched on the public health impacts of floods in Pakistan and wildlife diseases in Senegal's national parks. Immunological studies on dengue and other arboviruses addressed critical issues such as cross-reactivity and chronic infections. Particularly noteworthy was a presentation by a Taiwanese researcher on climate-driven genetic adaptations in dengue, which have enabled the virus to spread during colder winter periods, a discovery with significant implications for global dengue outbreak predictions.

Dr. Houriiyah Tegally, Head of Data Science at the Centre for Epidemic Response and Innovation (CERI), presented an update on CERI's ongoing research with a focus on the CLIMADE project. She also moderated a session featuring a presentation on Climate Change and Epidemics by Prof. Tulio de Oliveira, Director of CERI, further highlighting the intersection of environmental factors with epidemic trends.

"Collaboration across borders is essential not just for tackling the health crises of today, but for preparing us for those of tomorrow. This UWARN meeting has been a cornerstone event, fostering vital partnerships that empower us to face global health challenges with innovative and integrated solutions," said Dr. Tegally

The discussions underscored the necessity of continued international cooperation and dialogue. Participants engaged in comprehensive dialogues and laid plans for future joint research initiatives, emphasizing the importance of collaboration in advancing the global capacity to manage and mitigate the impacts of infectious diseases effectively.

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HIV Prevention Annual Meeting: Advancing HIV Prevention: Experts Convene to Explore Innovative and Collaborative Strategies

In a concerted effort to bolster the global fight against HIV/AIDS, leading experts from a host of prestigious institutions convened at the recent HIV Prevention Workshop that took place from 24-26 April 2024 near the Drakensberg, South Africa. The collaboration between the Ragon Institutes of Massachusetts General Hospital, Harvard, and MIT with Durban-based organizations such as the Centre for the AIDS Programme of Research in South Africa (CAPRISA), African Health Research Institute (AHRI), HIV Pathogenesis Programme (HPP), and the University of KwaZulu-Natal (UKZN), underscored the importance of international cooperation in tackling this pressing public health challenge.

The workshop provided a crucial platform for sharing pioneering research and discussing innovative strategies to combat HIV/AIDS. Among the notable topics were the advancements in novel formulations for topical pre-exposure prophylaxis (PrEP) and the exploration of vectored broadly neutralizing antibodies (bNAbs) as preventative measures. Additionally, the session on vaccine research delved into pre-clinical vaccine models, immunological barriers to HIV, and ways to foster effective antibody responses.

Prof Lenine Liebenberg, Immunology Chief Researcher at CERI co-chaired one of the sessions on efforts to modify the vaginal microbiome for HIV prevention. Prof Liebenberg emphasized the significance of this, stating, **"Modifying the vaginal microbiome represents a promising frontier in our pursuit of effective HIV prevention strategies. Understanding and manipulating this environment could revolutionise the HIV/STI prevention and disease control landscape."**

Read More : https://ceri.org.za/news/?token=745

The workshop concluded with a dynamic panel discussion focusing on the future of HIV prevention, treatment and cure efforts. The discussion underscored the urgent need for sustained collaboration and increased investment in research and development to keep pace with the evolving dynamics of HIV/AIDS.

The meeting not only facilitated a rich exchange of knowledge but also highlighted the critical role of interdisciplinary approaches in advancing the global HIV control agenda. As Prof Liebenberg remarked, "The complexities of HIV prevention require a multifaceted approach that bridges the gap between various scientific disciplines. Only through continued collaboration and innovative thinking can we hope to make significant strides in combating this disease."

Overall, the workshop served as a testament to the power of collective effort and strategic planning in the ongoing battle against HIV/AIDS, providing both hope and direction for future endeavors in this vital field of public health.

Prof Lenine Liebenberg, Head Immunology program at CERI, Stellenbosch University

Feature: Experts Convene in Kenya to Enhance Genomic Data Sharing for Outbreak Response, Kilifi, Kenya, April 2024.

From 15-17 April, 2024, an insightful workshop took place at the KEMRI-Wellcome Trust Research Programme in Kilifi, Kenya, bringing together global health and genomic data experts. This event, in collaboration with Oxford University, aimed at advancing the federated analysis of genomic data for public health, particularly focusing on enhancing rapid data sharing and analysis capabilities during the initial stages of outbreaks and epidemics.

The workshop fostered in-depth discussions on developing collaborative tools and strategies to address the challenges associated with the early sharing of pathogen genomes. A key proposal emerged for creating shareable, end-to-end phylogenetic pipelines to enable effective and federated genomic analysis.

Dr. Houriiyah Tegally, Head of Data Science at the Centre for Epidemic Response and Innovation (CERI), presented the work done within the CLIMADE network and highlighted the crucial role of data integration in understanding and responding to climate-amplified diseases and epidemics in Africa.

“This event was important to strengthen our collaboration with Oxford University, the WHO IPSN progam, and partners in Kenya," Dr. Tegally emphasized.

"The discussions and plans developed during this meeting will enhance the capacity of African countries to manage their own epidemics and pandemics, through the availability of tools and resources for real-time genomic epidemiology analysis, aligning with CERI’s mission.”

The workshop also served as a platform for sharing experiences and insights on genomic surveillance from different regions. Participants reviewed ongoing surveillance efforts of respiratory pathogens and arboviruses, comparing strategies and outcomes across continents. Dr. Tegally shared her insights from SARS-CoV-2 surveillance efforts in South Africa, highlighting the benefits of international collaboration.

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Engagement: CERI Football Club (CERI FC) Hits the Field for a Friendly Clash with CubeSpace

Photo: CERI FC in the newly CLIMADE sponsored kit

On Friday, April 19th, our newly formed soccer team, CERI FC, played its very first friendly match. The game was held in Stellenbosch, and it was much more than just a soccer match; it was about building a sense of team and community among our research group.

The team, led by Captain Graeme Dor, a PhD candidate at CERI, proudly wore their custom-designed kits for the first time. These kits were sponsored by CLIMADE-(Climate Amplified Diseases and Epidemics), which brings together a consortium of leading global scientists, focuses on bridging knowledge gaps, improving surveillance tools and expanding adequate interventions to decrease the impact of climate amplified diseases and epidemics. The initiative was launched in December 2022 and is already making important impacts in Africa.

Our opponents were CubeSpace ADCS, a company known for their innovative satellite control systems. They brought their best game, making it a fun and challenging match for everyone involved. This was a great chance for people from both teams to take a break from their tech-heavy work and enjoy some good, old-fashioned soccer.

The match was full of friendly rivalry and laughter, showing how much both CERI and CubeSpace value working together and respecting each other. Even though it was the first time our team played together, their great teamwork and spirit were promising signs of more exciting games in the future.

But the event was about more than just playing soccer. It celebrated our commitment to health, wellness, and community involvement. Playing sports like soccer helps our team members unwind, recharge, and build strong relationships, which are crucial for a harmonious and productive workplace.

Read More : https://ceri.org.za/news/?token=741

CERI & KRISP Papers

OPEN ACCESS

Save lives in the next pandemic: ensure vaccine equity now.
Nature (2024) doi: 10.1038/d41586-024-00545-3

Convergence of HIV and non-communicable disease epidemics: geospatial mapping of the unmet health needs in an HIV hyperendemic community in South Africa
BMJ Glob Health. (2024);9(1):e012730. doi: 10.1136/bmjgh-2023-012730.

Draft genome sequence of Priestia megaterium AB-S79 strain isolated from active gold mine
Microbiology Resource Announcements (2024):e0105523. doi: 10.1128/mra.01055-23.

An Oxford Nanopore Technology-Based Hepatitis B Virus Sequencing Protocol Suitable For Genomic Surveillance Within Clinical Diagnostic Settings
medRxiv (2024):2024.01.19.24301519. doi: 10.1101/2024.01.19.24301519.

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