



Message from the Head of the Laboratory

"Dear readers, colleagues, and partners, The months of May and June have been marked by knowledge sharing and regional cooperation. Thanks to our partnership with the World Health Organization (WHO), our laboratory successfully trained laboratory technicians from Burundi in the diagnosis and sequencing of Mpox. I would like to sincerely thank our team for their dedication, as well as all our partners for their continued trust. Together, let us keep making genomics a powerful tool in responding effectively to epidemics."

Aziza Amuri Adrienne

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HIGHLIGHTS OF THE MONTH OF MAY

Training on Mpox Diagnosis and Sequencing for the Burundian Team at INRB



From May 5 to 19, 2025, the Institut National de Recherche Biomédicale (INRB), through its Pathogen Genomics Laboratory (PGL) and in collaboration with the World Health Organization (WHO), organized a training workshop in Kinshasa on molecular diagnosis and sequencing of the Mpox virus.

This session, fully dedicated to building the capacity of six laboratory technicians from Burundi, is part of regional efforts to strengthen epidemiological surveillance and outbreak response for Mpox.

The six participants were trained in PCR-based diagnostic methods, sequencing using Illumina and Nanopore platforms, and basic bioinformatics analysis.

Supervised by the PGL-INRB team, the training provided hands-on experience throughout the workflow from DNA extraction to genomic data analysis. Through this initiative, INRB continues to reinforce its role as a the Regional Reference Laboratory for training and reference in genomic surveillance of emerging pathogens.



Participation in the Regional Workshop on Wastewater Surveillance in East Africa in Nairobi



From May 20 to 22, 2025, a regional workshop on wastewater surveillance was held in Nairobi, bringing together representatives from 11 East African countries, along with the Democratic Republic of the Congo (DRC).

Organized by the United Nations Environment Programme (UNEP) in collaboration with the International Livestock Research Institute (ILRI) and the World Health Organization (WHO), and supported by Health Emergency Preparedness and Response Authority (HERA), the event aimed to strengthen regional capacities in environmental health surveillance.

Discussions focused on the establishment of national monitoring systems, the harmonization of regional approaches, and technical challenges in low-resource settings. Innovative perspectives such as surveillance in ports, airports, and aircraft were also explored.

The Pathogen Genomics Laboratory of INRB represented the DRC at this workshop, sharing its experience in genomic sequencing of wastewater samples and highlighting the critical role of genomics in early pathogen detection and public health crisis response.



Training on Bacterial Identification and Genomic Sequencing in Ghana



Capacity Building Mission within the KLEBGEN Project on Identification and Sequencing of Klebsiella pneumoniae and Escherichia coli.

From May 26 to 30, 2025, the Pathogen Genomics Laboratory team at INRB successfully participated in an intensive training organized by CDC Africa at the Noguchi Research Institute Laboratory in Accra, Ghana.

The training focused on manual and automated methods for identifying bacteria isolated from blood cultures, as well as genomic sequencing techniques for these major public health pathogens.

This initiative is part of the laboratory's commitment to strengthening genomic surveillance of high-impact pathogens and improving the response to antimicrobial-resistant infections.



HIGHLIGHTS OF THE MONTH OF JUNE

Second Phase of Training on Mpox Diagnosis and Sequencing for the Burundian Team at INRB



As part of the regional Mpox response, the National Institute of Biomedical Research (INRB), through its Pathogen Genomics Laboratory (LGP), hosted six biologists from Burundi from June 9 to 23, 2025.

These professionals representing the National Veterinary Laboratory, the National Reference Laboratory of INSP-Burundi, and ISABU took part in a comprehensive training program funded by WHO-Burundi and supported by WHO-DRC.

The training covered the full scope of molecular diagnosis and genomic sequencing of the Mpox virus. Participants were trained in the entire process, from PCR diagnostics to genetic sequence analysis. They worked hands-on with both Illumina and Nanopore platforms, learning how to analyze results and apply basic data interpretation methods.

At the end of the training, Professor Placide Mbala, Head of the Department of Epidemiology and Global Health at INRB, presented an overview of the current Mpox situation in the DRC. He highlighted how genomic sequencing is being used to track the virus's evolution, better understand its transmission patterns, and adapt public health actions based on the data collected.



Participation in the KlebGEN Regional Workshop on E. coli and K. pneumoniae in Kampala



From June 16 to 27, 2025, a delegation from the Pathogen Genomics Laboratory (LGP) of the INRB participated in the regional workshop on bioinformatics and genomic data analysis focused on *Escherichia coli* and *Klebsiella pneumoniae*, held in Kampala, Uganda.

This scientific gathering, organized by Africa CDC as part of the KlebGen project, brought together experts from the DRC, Uganda, Morocco, Mozambique, Zimbabwe, Ethiopia, and Cameroon to strengthen the regional response to circulating strains across the continent.

Over the two-week workshop, the INRB team received hands-on training on technical topics ranging from data cleaning to phylogenetic analysis. Participants worked with advanced tools such as Kleborate, Theiaprok, Pathogenwatch, and Terra.bio to enhance the detection, characterization, and surveillance of strains responsible for serious infections.

The first week focused on bacterial identification, population structure, capsular and antigenic typing (K/O), and antimicrobial resistance mechanisms. During the second week, participants concentrated on phylogenetic tree analysis, investigation of epidemiological clusters, and comparison of genotypic and phenotypic resistance profiles.





Co-Circulation of Two Mpoxy Virus Subclades in Kinshasa: A Genomic Surveillance Alert

In a study published in *Eurosurveillance* in 2024, Wawina et al. reported the co-circulation of Mpoxy virus subclades Ia and Ib in the city-province of Kinshasa, Democratic Republic of the Congo (DRC), between July and August 2024.

This discovery is based on the genomic analysis of 12 samples from 11 suspected cases reported across six health zones, with a particular focus on Limete, where both subclades were simultaneously detected.

Phylogenetic analyses suggest multiple independent introductions of the two subclades into the city. While subclade Ia has historically been dominant in the DRC, the growing presence of subclade Ib already associated with sustained human-to-human transmission and first identified in Kamituga (South Kivu Province) raises serious public health concerns.

👉 [Read the full article here: <https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2024.29.38.2400592>](https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2024.29.38.2400592)

A Revolution in Poliovirus Detection in the DRC: A Faster, More Accurate, and Cost-Effective Method

A prospective study published in the prestigious journal *Nature* in 2023 reveals that Direct Detection of Poliovirus by Nested PCR and Nanopore Sequencing (DDNS) could radically transform polio surveillance in the Democratic Republic of the Congo (DRC).

Conducted at the Pathogen Genomics Laboratory of INRB, the study compared this innovative approach with the conventional method combining cell culture, quantitative PCR, and Sanger sequencing. The findings are striking: DDNS detected more cases (2.7% vs. 2.2%), with comparable sensitivity, while reducing the average confirmation time from 30 to just 7 days.

This accelerated turnaround enabled the identification of some outbreak clusters up to 23 days earlier a critical advantage in the fight against vaccine-derived poliovirus outbreaks, which continue to circulate in the DRC despite the eradication of wild poliovirus.



In summary, DDNS represents a local, rapid, reliable, and sustainable solution, well-suited for resource-limited settings. Its large-scale adoption could mark a turning point in the global eradication of poliomyelitis.

Read the full article: [Sensitive poliovirus detection using nested PCR and nanopore sequencing: a prospective validation study | Nature Microbiology](https://doi.org/10.1038/s41564-023-0750-1)



TONY WAWINA BOKALANGA, MD, MSc, PhD

Dr. Tony Wawina Bokalanga is a medical biologist with a PhD in Biomedical Sciences (Virology) from KU Leuven (Belgium). His doctoral research focused on the molecular evolution of the Ebola virus and the role of KIR receptors (expressed on natural killer cells – NK cells) in the outcome of Ebola virus disease.

Currently based at the National Institute of Biomedical Research (INRB) in Kinshasa, he co-leads the Genomic Sequencing Laboratory within the Department of Epidemiology and Global Health.

He is actively involved in outbreak responses for several emerging diseases, including Mpox, COVID-19, and filovirus-related diseases, supporting the implementation of PCR and sequencing protocols, particularly using the Oxford Nanopore platform.

Having participated in numerous international conferences, he plays a key role in shaping strategies for epidemic prevention, diagnosis, and control in the Democratic Republic of the Congo.

He is a co-author of approximately 30 scientific publications in international peer-reviewed journals.

Among his recent works:

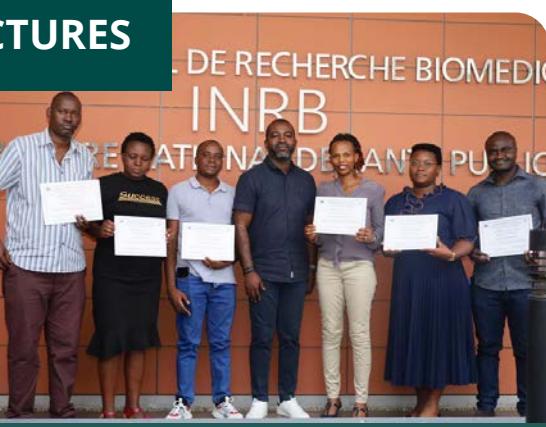
- Wawina et al. *Epidemiology and phylogenomic characterisation of two distinct mpox outbreaks in Kinshasa, Democratic Republic of the Congo involving a new subclade Ia lineage: a retrospective observational study.* Accepted for publication in *The Lancet*, 2025.

- Makangara-Cigolo et al. *Clade Ia Mpox Virus Linked to Sexual Transmission, Democratic Republic of the Congo, August 2024.* *Emerging Infect Dis.* 2025; 31(5):1033-1037.
- Bangwen et al. *Suspected and confirmed mpox cases in DR Congo: a retrospective analysis of national epidemiological and laboratory surveillance data, 2010-23.* *The Lancet*, 2025 Feb 1; 405(10476):408-419.
- Brosius et al. *Epidemiological and clinical features of mpox during the clade Ib outbreak in South Kivu, Democratic Republic of the Congo: a prospective cohort study.* *The Lancet*, 2025 Jan 29:S0140-6736(25)00047-9.
- Kinganda-Lusamaki et al. *Clade I mpox virus genomic diversity in the Democratic Republic of the Congo, 2018-2024: Predominance of zoonotic transmission.* *Cell*, 2025 Jan 9; 188(1):4-14.e6.
- Wawina et al. *A retrospective genomic characterisation of the 2022 mpox outbreak in Belgium, and in vitro assessment of three antiviral compounds.* *EBioMedicine*, 2024 Dec; 110:105488.
- Wawina et al. *Co-circulation of monkeypox virus subclades Ia and Ib in Kinshasa Province, Democratic Republic of the Congo, July to August 2024.* *Eurosurveillance*, 2024 doi:10.2807/1560-7917.

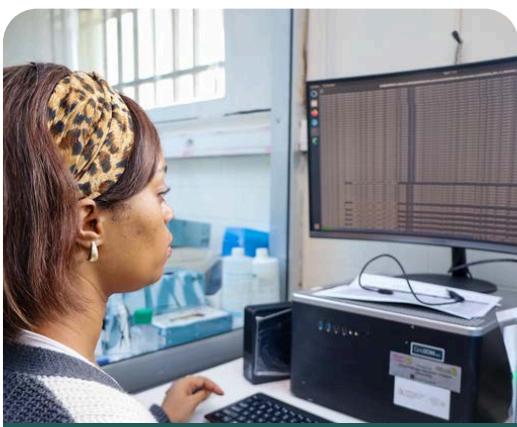
MAY AND JUNE IN PICTURES



Launch of Samples on Biofire for Etiological Research



Certificate Presentation at the End of the Training on Mpox Diagnosis and Sequencing with the Burundian Team



Bioinformatics Analysis of Mpox Samples on GridION



Closing of the Training on the RADIONE Point-of-Care PCR Device for Mpox Virus, Organized by COUSP and INRB



IMT Team Visit to the New Offices of the Pathogen Genomics Laboratory



Evaluation of Mpox Rapid Tests by the INRB/Goma Team in Kinshasa



Group Photo During the Visit of the New Director of IMT to INRB



Group Photo from the Training Session for the Implementation of the MBOTE-HIVAX Clinical Trial



Certificate Ceremony for the Mpox Diagnosis and Sequencing Training with the Second Burundian Team

PUBLICATIONS : From January 1 to June 20, 2025

1. Three Cases of Vertical Transmission of Clade Ib Mpox Virus. N Engl J Med (Juin 2025) <https://www.nejm.org/doi/10.1056/NEJMc2503347>
2. Clade Ia Monkeypox Virus Linked to Sexual Transmission, Democratic Republic of the Congo, August 2024- https://wwwnc.cdc.gov/eid/article/31/5/24-1690_article
3. Tecovirimat for Clade I MPXV Infection in the Democratic Republic of Congo-NEJM6-(Avril 2025)- <https://www.nejm.org/doi/10.1056/NEJMoa2412439>
4. Clinical presentation and epidemiological assessment of confirmed human mpox cases in DR Congo: a surveillance-based observational study- The Lancet(Avril 2025). [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(25\)00152-7/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)00152-7/abstract)
5. Comparison of EBOV GP IgG Antibody Reactivity: Results from Two Immunoassays in the Democratic Republic of the Congo- Journal of Virological Methods (avril 2025) <https://www.sciencedirect.com/science/article/abs/pii/S0166093425000473?via%3Dihub>
6. Public health priorities for mpox clade Ib in pregnant, breastfeeding, and paediatric populations in DR Congo- The Lancet (Avril 2025)-[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(25\)00152-5/abstract](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(25)00152-5/abstract)
7. Epidemiological and clinical features of mpox during the clade Ib outbreak in South Kivu, Democratic Republic of the Congo: a prospective cohort study - The Lancet (2025) <https://www.sciencedirect.com/science/article/abs/pii/S0140673625000479>
8. Clade I mpox virus genomic diversity in the Democratic Republic of the Congo, 2018–2024: Predominance of zoonotic transmission - Cell (mars 2025)[https://www.cell.com/cell/fulltext/S0092-8674\(24\)01199-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867424011991%3Fshowall%3Dtrue](https://www.cell.com/cell/fulltext/S0092-8674(24)01199-1?_returnURL=https%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0092867424011991%3Fshowall%3Dtrue)
9. Establishment of a regional Mpox surveillance network in Central Africa: shared experiences in an endemic region - Global Health Research and Policy (Mars 2025) <https://ghrp.biomedcentral.com/articles/10.1186/s41256-025-00408-y>
10. Suspected and confirmed mpox cases in DR Congo: a retrospective analysis of national epidemiological and laboratory surveillance data, 2010–23 - The Lancet (février 2025)[https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(24\)02669-2/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)02669-2/abstract)
11. Evolving Epidemiology of Mpox in Africa in 2024 - The New England Journal of Medicine (février 2025)<https://www.nejm.org/doi/full/10.1056/NEJMoa2411368>
12. Concurrent outbreaks of mpox in Africa—an update - The Lancet (janvier 2025) [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(24\)02353-5/abstract](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)02353-5/abstract)

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